1989

The Defense Priorities and Allocation System in an industrial mobilization.

Sutter, Robert Dismas

Monterey, California. Naval Postgraduate School

NAVAL POSTGRADUATE SCHOOL
Monterey, California

THESIS

THE DEFENSE PRIORITIES AND ALLOCATION SYSTEM IN AN INDUSTRIAL MOBILIZATION

by

Robert Dismas Sutter

December 1989

Thesis Advisor: Paul M. Carrick

REPORT DOCUMENTATION PAGE

Form Approved
OMB No 0704-0188

1a REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b RESTRICTIVE MARKINGS
2a SECURITY CLASSIFICATION AUTHORITY	3 DISTRIBUTION / AVAILABILITY OF REPORT Approved for public release; distribution is unlimited
2b DECLASSIFICATION / DOWNGRADING SCHEDULE	
4 PERFORMING ORGANIZATION REPORT NUMBER(S)	5 MONITORING ORGANIZATION REPORT NUMBER(S)
6a NAME OF PERFORMING ORGANIZATION Naval Postgraduate School 6b OFFICE SYMBOL (If applicable) 36	7a NAME OF MONITORING ORGANIZATION Naval Postgraduate School
6c ADDRESS (City, State, and ZIP Code) Monterey, California 93943-5000	7b ADDRESS (City, State, and ZIP Code) Monterey, California 93943-5000
8a NAME OF FUNDING / SPONSORING ORGANIZATION 8b OFFICE SYMBOL (If applicable)	9 PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c ADDRESS (City, State, and ZIP Code)	10 SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO / PROJECT NO / TASK NO / WORK UNIT ACCESSION NO

11 TITLE (Include Security Classification)
THE DEFENSE PRIORITIES AND ALLOCATION SYSTEM IN AN INDUSTRIAL MOBILIZATION

12 PERSONAL AUTHOR(S)
Sutter, Robert D.

13a TYPE OF REPORT	13b TIME COVERED	14 DATE OF REPORT (Year, Month, Day)	15 PAGE COUNT
Master's Thesis	FROM _____ TO _____	1989, December	106

16 SUPPLEMENTARY NOTATION
The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

17 COSATI CODES			18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Defense Priorities and Allocation System; Industrial Mobilization; Priorities; Allocations

19 ABSTRACT (Continue on reverse if necessary and identify by block number)

Successful industrial mobilization is recognized as fundamental to the success of a military mobilization. The U.S.'s present system for allocation of raw materials and component parts is the Defense Priorities and Allocation System (DPAS). DPAS represents a major mechanism for industrial mobilization. Its success or failure to meet mobilization requirements is an excellent gauge for overall industry-military performance in a mobilization.

Through a review of current regulations and procedures, a study of past industrial mobilizations in wartime and of recent mobilization exercises, this study demonstrates that DPAS can adequately allocate limited resources during mobilization if the critical materials requirements are updated and if thorough and pre-legislated planning is enacted.

20 DISTRIBUTION / AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	21 ABSTRACT SECURITY CLASSIFICATION Unclassified
22a NAME OF RESPONSIBLE INDIVIDUAL Prof. Paul M. Carrick	22b TELEPHONE (Include Area Code) (408) 646-2939 22c OFFICE SYMBOL Code 54Ca

The Defense Priorities and Allocation System in an Industrial Mobilization

by

Robert Dismas Sutter
Lieutenant Commander, Supply Corps, United States Navy
B.S., United States Naval Academy, 1977

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
December 1989

ABSTRACT

Successful industrial mobilization is recognized as fundamental to the success of a military mobilization. The U.S.'s present system for allocation of raw materials and component parts is the Defense Priorities and Allocation System (DPAS). DPAS represents a major mechanism for industrial mobilization. Its success or failure to meet mobilization requirements is an excellent gauge for overall industry-military performance in a mobilization.

Through a review of current regulations and procedures, a study of past industrial mobilizations in wartime and of recent mobilization exercises, this study demonstrates that DPAS can adequately allocate limited resources during mobilization if the critical materials requirements are updated and if thorough and pre-legislated planning is enacted.

TABLE OF CONTENTS

I. INTRODUCTION

The current international focus on arms control and the potential for U.S. force reductions reemphasize the importance and necessity for adequate industrial mobilization plans. Recent studies have documented the United States' dependence on foreign sources for raw materials and various component parts and the significant impact this would have on the U.S.'s ability to mobilize industry. It can safely be assumed that sometime during the mobilization process the demand for specific raw materials and particular component parts will exceed the available supply.

The current system for allocating raw materials and component parts during an industrial mobilization is the Defense Priorities and Allocation System (DPAS).

This thesis will investigate the functioning of the Defense Priorities and Allocation System (DPAS) during an industrial mobilization. Research will include a review of general materials allocation in an industrial environment during mobilization and include a review of the control systems that were used in the past.

This thesis will review the current regulations and procedures that govern DPAS. It will analyze the "lessons learned" from previous industrial mobilizations and recent

mobilization exercises to see if the current DPAS is adequate. This thesis will focus on the materials allocation portion of the DPAS.

The objective of this thesis is to determine if the current DPAS will be able to adequately allocate limited resources among the various civilian and military production facilities during mobilization. Secondary objectives include:

1. identifying current problems facing DPAS.
2. researching to see if lessons learned from past wars and recent mobilization exercises have been incorporated into the DPAS.
3. identifying improvements that could be made to the current system.

The methodology of this thesis will be to conduct a comprehensive examination of current literature and conduct interviews with personnel involved in the DPAS.

The benefits of this thesis will be to provide a better understanding of the DPAS, and to provide a review and analysis of the DPAS material allocation procedures.

II. BACKGROUND

Materials allocation during an industrial mobilization is briefly presented in the five sections below. Areas covered include: (1) impact of possible force restructure, (2) dependence on foreign sources, (3) LOGISTICS 2010, (4) materials allocation used as the "synchronizer" of production, and (5) methods used to control production.

A. IMPACT OF POSSIBLE FORCE RESTRUCTURE

Fundamental national defense issues are presently being re-thought by defense strategists. This rethinking is in response to the recent statements by the Soviet Union that it may significantly reduce its military strength as well as the current emphasis on arms negotiations, and to the reduction in the U.S.'s defense budget.

Moreover, this rethinking involves the acknowledgement among defense and diplomatic experts that the likelihood of a nuclear war is very small. The past thinking that nuclear weapons enabled the U.S. to reduce its conventional force structure equated to the conclusion that any future large conflicts would be short in duration. The previous thinking is being replaced with the general position that any future large conflicts would probably last for a considerable length of time and that the winner of any future large conflict would

be the nation(s) best able to sustain a long conflict. This sustainability would be in direct proportion to the existing stocks of equipment and supplies, and the nation's ability to mobilize its industrial base to produce the additional equipment and replace the equipment destroyed in the conflict.

The move to put more emphasis on Reserve components and less on active duty forces becomes a critical issue of U.S. force structure. The Reserve concept carries with it two significant requirements: (1) the reliance on America's ability to mobilize both its military forces and current equipment/supply inventories, and (2) the nation's ability to expand its economy to produce the equipment and supplies to fill the mobilization shortfall and carry the war machine during any sustained conflict.

Mobilization will doubtless require substantial transfer of resources from peacetime to military outputs. The Nation's ability to expand its economy in the production of war material is referred to as industrial mobilization or economic mobilization. The importance of industrial mobilization, especially considering the present rethinking, demands that industrial mobilization be a vital part of the U.S. national security planning process.

When discussing industrial mobilization, there are two issues: one, involves the actual mobilization itself, and two, the actual plans for a mobilization. The actual mobilization is, naturally, contingent on the actual plans for

mobilization. The bureaucratic complexity of the planning and execution of the plans on systems controlling industrial mobilization is evident when one reviews past conflicts.

Industrial mobilization at its basic level requires three simple ingredients: labor, production equipment, and material. The intricacies of a war economy can be viewed by studying the facets of one of the fundamental ingredients of industrial mobilization--material. Control of the material supplies used to produce the weapons of war is required during all facets of an industrial mobilization. This would include the stage prior to declared war where strategic planners have convinced politicians to increase the military procurement budget in preparation for the official declaration of war, the dynamic growth stage where the economy is in the process of change from a producer of primarily consumer goods to a producer of primarily military goods, to a period of sustainability where current industrial capacity is full and the emphasis is on building new capacity and looking for scarce material substitutes.

B. DEPENDENCE OF FOREIGN SOURCES

In assessing the future mobilization material needs, the U.S.'s current position is one of significant foreign dependence on specific materials used in defense production. For a variety of reasons, the U.S. is dependent on foreign

sources for not only some specific critical raw and semi-refined materials but also for a variety of component parts. The importance of a reliable source of materials for industrial mobilization has resulted in numerous studies covering this area since the late 1970's.

For primarily economic and environmental reasons, the U.S. as shown on Figure 1 relies heavily on foreign producers for a significant amount of basic production ingredients, both raw and semi-refined. Although the U.S. has abundant resources and idle capacity in the basic steel materials, the U.S. is deficient in the materials used in high technology defense production. Combining this fact with the political and economic instability of Third World exporting nations, where we get most of our raw materials for high technology items, and the typical long logistic pipeline, the risk is high that in the event of a large conflict these materials would be in short supply.

One example is ferroalloys:

> Ferroalloys represent a basic processing industry sector that provides essential raw materials to many streams of manufacturing. As a key component of steel manufacturing, ferroalloys are important to national security. By imparting unique characteristics to finished steel and cast iron and by inhibiting by-products which diminish steel quality, ferroalloys are irreplaceable to steel production. The principal ferroalloys of concern to defense planners are: manganese, chrome and silicon. (Ellison, Frumkin, Stanley, 1988, p. 28)

> As of 1985 the domestic ferroalloy industry consisted of 17 plants employing 4100 people with shipments of 700 short tons while working at 60 percent capacity. In general terms this represents a 50 percent deterioration of the industry

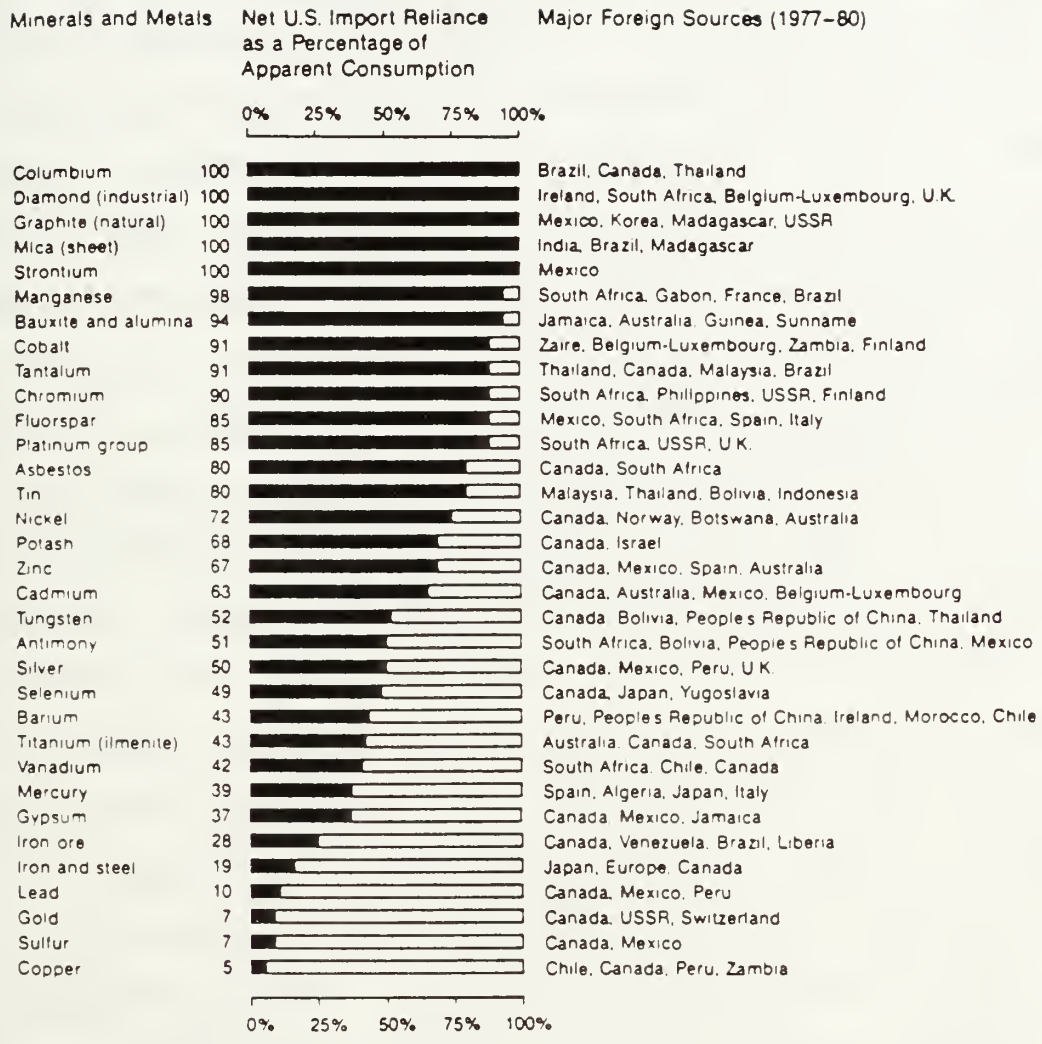

Figure 1. Net U.S. Import Reliance as a Percentage of Apparent Consumption (Mikesell, 1987, p. 21)

since 1978 when employment stood at 8500 and shipments were in the order of 1500 short tons. (Ellison, Frumkin, Stanley, 1988, p. 28)

Imports from 1979 to 1985 have increased from 45% of apparent consumption to over 60 percent. Since 1985 there has been no commercial domestic production of high-carbon ferrochromium in the U.S. and only very limited commercial production of high carbon ferromanganese is currently available. (Ellison, Frumkin, Stanley, 1988, p. 31)

The U.S. dependence on foreign raw materials has been substantiated and documented with growing concern since the 1950s. To help alleviate the foreign dependence, numerous legislative and administrative measures have been adopted, including the establishment of a National Defense Stockpile (NDS) of strategic and critical materials. The NDS is considered by most authorities to be inadequate. Thus, the U.S. is still heavily dependent on foreign suppliers. It should be noted that foreign dependence represents the workings of a competitive international economy. Materials are obtained by the U.S. suppliers from the lowest-cost sources throughout the world irrespective of location. In wartime some domestic sources for selected materials may become available. Further, substitute materials may be used in some cases for imported supplies that are cut off.

Complex weapon systems of today use numerous component and sub-component parts. During a 1983 DoD sponsored Industrial Response Simulation exercise, it was learned that, "virtually all missile and sonobuoy manufacturers depended heavily upon off-shore producers of electronic components such as

integrated circuits." (Vawter, 1985, p. 29) Additionally, specialization and the emergence of a global market has prompted one U.S. admiral to write,

> We have always known of our nation's dependency on key raw materials. But now spare parts and components of weapons systems come from industrial plants far beyond our shores. I just returned from a Navy Research and Development facility where massive motors come from England, casting from Israel, and special steel from Belgium--all were products not available in the U.S. (McKinnon, 1989, p. 2)

Therefore, not only is the U.S. dependent on foreign resources but it must almost virtually pull it from the four corners of the earth. Another phase of foreign dependence takes on a complex nature politically and diplomatically. This issue involves foreign ownership of U.S.-located production and supplier companies. For example, in the critical issue of ferroalloys discussed previously, "Over half of the U.S. domestically-produced ferroalloys come from non-domestically-owned facilities." (Ellison, Frumkin, Stanley, 1988, p. 32)

During WW II the U.S. government redirected production of numerous U.S. auto plants to military vehicle plants. Today, the U.S. government would not have this flexibility since Japan owns and operates parts and component distributing facilities in the U.S. Clearly, the potential is high for a supply disruption caused by a reluctant overseas supplier, material losses during the long logistic pipeline, or because of a reluctant foreign-owned domestic producer who refuses to supply his goods to the U.S. mobilization effort.

C. LOGISTICS 2010

The DoD's awareness of the importance of mobilization logistics planning is reflected in the 1988 edition of the DoD's long-range logistics strategy titled Logistic 2010. This document includes as one of its four goals "to improve industrial base responsiveness to DoD needs." (U.S. Department of Defense, 1988, p. 1)

This goal is supported by an objective which is "to improve preparedness plans for DoD organic and commercial industrial base surge/mobilization requirements." (U.S. Department of Defense, 1988, p. 25) This portion of the plan includes developing requirements, identifying shortfalls in materials for mobilization and developing plans to deal with these shortfalls. (U.S. Department of Defense, 1988, p. 25)

D. THE "SYNCHRONIZER" OF PRODUCTION

Materials control will be a fundamental management control task during the mobilization. This concept is substantiated in Bernard M. Baruch's "Priorities: The Synchronizer of Production," published in the Harvard Business Review in 1941.

Baruch drew on his extensive experience from WW I when he served as the Chairman of the War Industries Board. He postulates that priorities function as a "synchronizer" of the production process during an industrial mobilization. Priorities can be defined as a step function containing a

small number of steps. It is an approximation to a standard economic demand curve.

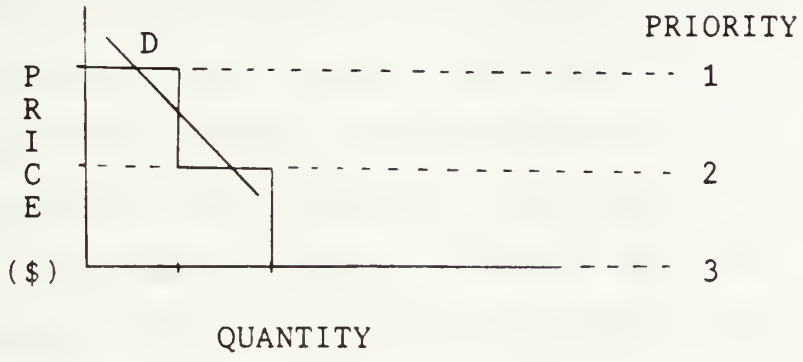

Figure 2. Compression of a 3-step Priority System and a Demand Curve

Priorities which are properly used and administered will ensure that the production machinery of a nation is efficiently utilized. That efficiency is based on accurate prediction of production lead times, required delivery dates for material and components, and effective scheduling. There is no small importance attached to acheiving the proper mix of output even though some outputs are considered more important, or needed sooner, than others. The objective is to ensure that the aggregate production of the entire mobilization effort is accomplished in the most efficient manner. This efficiency will ensure that raw materials and components required for different production processes will be available for the highest program at the time it is needed and only at that time. This will free up other raw materials and

components for the next lower priority program. Thus, the schedule of needed raw materials and component parts will be allocated through the use of a priorities system and this system when operated with accurate lead times and required delivery dates will essentially synchronize the nation's production in the most effective and efficient manner. (Baruch, 1941, pp. 261-270) Introduction of a priorities system is equivalent to introducing a second monetary system with a second unit of account. Mobilization planning must consider how to mesh the two systems to achieve its objectives.

Additionally, Baruch stresses the need for having a system of price controls accompanying a priority system because the priority system effectively takes the place of the usual market mechanisms that prevent undue price escalation.

E. METHODS USED TO CONTROL PRODUCTION

Materials management today is receiving, as it has in the past, much notice. Acronyms such as JIT(Just In Time) and MRP (Materials Requirements Planning) are considered production control devices based on the material movement either to the assembly line or through the assembly line.

In a mobilization environment, as supplies of raw materials and component parts become scarce, national defense needs add another factor called priorities. The use of priorities attempts to ensure that the most critical military

needs would receive the material before the less critical program. This, in a small way, could be analogous to the item's market competitiveness today where responsiveness, and therefore priorities, play a key role in terms of profit.

Based on past historical experience, viz. WW II, next to government contracts, materials control is the most effective tool for converting industry to war and for inducing manufacturers to participate in the programs. (Williams, 1954 and 1957, p. 43) Materials management today, as in the past, is receiving much notice for this very reason.

Five basic methods have been used to control scarce materials during mobilization:

> 1. Cutting down the use of critical materials permitted in specific products (accomplished by "M" or conservation orders). This system does not prevent the making of the item designated in the order, but compels the producer to find some other material to replace that which it seeks to conserve....
> 2. Prohibition or limitation of the output of various kinds of items requiring critical materials("L" or limitation orders). These orders are directed against the product itself....
> 3. Inventory controls. In times of emergency, producers may be forbidden to build up excessive inventories in order to prevent the hoarding of critical materials....
> 4. Priorities. A system of priorities places products in their order of importance for purposes of meeting an emergency....
> 5. Allocations. Since materials begin to run short in an emergency, rendering the priorities system inadequate, a system of allocations is used to divide them among the essential programs. The feature of allocation that distinguishes it most clearly from the priorities system is that the contractor gets a certain quantity of available resources rather than a preferential right to buy them if they can be found. (Williams, 1954 and 1957, pp. 44-45)

III. HISTORICAL REVIEW

A. WORLD WAR I UP TO WORLD WAR II

This portion of history is significant in that it emphasized that a future war would be a world-wide war demanding the involvement of the entire U.S. economy mobilized to produce weapons in a magnitude never before undertaken. (Vawter, 1983, p. 6) With the WW I experience dawned the realization that capability and success did not equate, that there was something missing in the formula--effective planning. The War Industries Board was the prime vehicle for industrial mobilization during WW I, but the Board itself was hardly a planned organization. It was never "born." Rather, it was more a nebulous mass of needs, resources and ideas which coalesced slowly into a mobilization machine which admirably fitted the requirements of an unprepared nation. It is not wrong to say that the War Industries Board was a machination of the public, a "knowing" minority of private citizens who recognized the helplessness of a country unprepared for war. This group includes some great military minds such as General Leonard Wood and General Crozier who espoused readiness although they initiated no official actions. In 1915 Woodrow Wilson initiated the founding of the Naval Consulting Board, which was headed by Thomas Edison and represented the pooling of intellectual resources from 11

different scientific disciplines. From this Board evolved the Committee on Industrial Preparedness whose focus was on the whole of all military requirements, rather than just the Navy. This organization was not a government organization. It was financed and operated by private citizens. It was a very worthy tool for information gathering regarding war service capabilities of some 20,000 manufacturing plants. This body of information was collected rapidly and made available by September 1916. Subsequently, the information was utilized by the Council of National Defense and the War Industries Board. (Clarkson, 1923, pp. 12-13) In the legislative arena, Congress passed the Military Appropriations Act which precipitated the creation of the Council of National Defense. Although this act was law in August of 1916, the group's first meeting was not until December 6 of that year. This lassitude demonstrates the dichotomous thinking between the private sector and the Congress that represented that same sector. The council was "intended as a peacetime body which should prepare the country for an emergency-by thought rather than by action, by study rather that by performance." (Clarkson, 1923, pp. 20-21) In other words, this council produced no legislation, thus the council continued to evolve under such notables of the time as Daniel Willard, president of the B and O Railroad, Bernard Baruch, financier, Howard Coffin, Vice-president of the Hudson Motor Company and Julius Rosenwald, president of Sears, Roebuck and Company. These men made up

the Advisory Commission and represented the executive branch. On the Council proper were the Secretary of War, the Secretary of the Navy, the Secretary of Interior, the Secretary of Agriculture, the Secretary of Commerce and the Secretary of Labor.

It was Bernard Baruch's personal interest in the steel and metal industries and his beneficial suggestion that the board be attentive to industries' raw materials and how to pool resources from industries that transformed the commission into an official tool of the government. "The War Industries Board in its intermediate and final forms was the lineal descendent of the Council's dealings with raw materials, although chronologically it took its first recognized form in the General Munitions Board." (Clarkson, 1923, p. 27) The understanding that control of supply of raw materials and the means to use them meant the control of production helped mold the future structure of the Commission. It was reduced to committees to interact with various industries. Business contracts between the War and Navy Departments and the industries providing raw materials were created. On the recommendation of the commission, the War Department applied to Congress for monies. As the War Department was unsure of its needs, a lump sum figure was requested, the size of which was to be determined by Congress. Congress responded with something less than enthusiasm. The Council of National Defense was moved to appoint a purchasing board made up of

Army and Navy Department heads and officers appointed by those heads to determine needs and make purchases. A noted manufacturer of the time, F.A. Scott, was appointed chairman. The name was changed to the General Munitions Board. Its purpose was to coordinate purchases of the Army and Navy, aid them in acquiring raw materials and in establishing precedence of orders between the military and industry.

The General Munitions Board was quickly found to be inadequate. It had been reduced to so many committees that it was too decentralized. In order to remedy this serious flaw the War Industries Board was instituted on July 8, 1917, three months after the U.S. entry into WW I in April 1917. (Clarkson, 1923, pp. 28-36) Its functions, briefly, are as follows:

> (1) to allocate commodities of which there was or was likely to be a deficit, to encourage their increased production and effect their orderly flow into channels most conducive to the purposes of war, which necessitated "priority" and price-fixing; (2) to analyze, bring together, measure, alter, and restrain the demands of the Government of the Allies and of the public; (3) to ascertain to what extent and in what manner the supplies could meet the requirements; and to take the action thereby indicated. (Clarkson, 1923, pp. 45-46)

The War Industries Board became much more than these functions would imply when President Wilson issued the Executive Order on March 4, 1918 endowing the board with authority proceeding directly from the Executive Branch itself. In effect, the war was not conducted by the military alone but by the War Industries Board and the Military with

the War Industries Board "leading the charge." (Clarkson, 1923, p. 48)

Prior to entry into WW I there was a complete absence of plans. The lack of definitive requirements, the "what and when" of materials was stark (Clarkson, 1923, p. 5). It was recognized among nonofficial leaders as early as 1914 that the United States was not ready for war. This reality was not treated officially until 1916, in the National Defense Act. This act charged the Assistant Secretary of War with responsibility for provisions to be made to adequately meet the war needs by some mechanism of materials mobilization and industrial organization. Through this Act of Congress, evolved the Industrial Mobilization Plan (IMP) (1930-31, 1933, 1936, 1939). The IMP was a sincere attempt to use lessons learned from the WW I experience. Its accomplishments include the spelling out of governmental organization and administrative procedures for the mobilization of industry. Its handicaps: who would be the opponent, where would a confrontation occur, and what powers would really be in the President's sphere of authority. Its modus operandi: assignation of priorities including priority classification of orders, allocations of specific facilities and licenses, permits, warrants, and embargoes where needed. Control of foreign trade was elemental to the success of the whole. Its greatest flaw was that it did not consider the fact that the U.S. might have to provide munitions aid to the allies.

Indeed, this critical issue is still with us. Its greatest virtue: it precipitated a consciousness of planning needs and may well have shortened the mobilization process after the onset of WW II. (Clem, 1983, pp. 30-34)

Despite the IMP and the new IMP "consciousness", many of the mistakes in administrative controls of WW I were repeated during WW II. Because of the repetition of error in WW II virtually every possible variation of industrial control techniques were given a chance. (Novick, Anshen, Truppner, 1949, pp. 3-4) For example, there was a time during WW II when the profound sense of urgency following the attack on Pearl Harbor dictated that contracts providing war materials were worthy of any price. As a prompter for production this worked as a tonic, but as America got into full swing its "Pandora's Box" was opened. What at one time stimulated use of idle resources and war production, now threatened basic production efficiency. War contractors now had their cake and could indeed, eat it too. With more than half the nation's resources at their disposal and extravagant financial means, strict economy was left by the wayside. The important foregone alternatives involved time and contracting methods were adopted to economize on the time required. It became evident that direct controls must be improved. This might well have been the first "birth pains" of our modern DPAS. (Department of the Army, 1959, pp. 275-276) It is encouraging to note that not all mistakes were repeated. Notably, the

"Cost Plus Percentage Fee" contracts of WW I that had been hot beds of abuse were not used during WW II. Only "Cost Plus Fixed Fee" contracts were used.

One cannot discuss the success or failure of the planning mechanism or of the industrial control techniques which accomplished industrial mobilization without assessing the success or failure of the War Industries Board (WIB). The WIB accomplished most of its feats haphazardly. It was established three months after the United State's entry into WW I, was not a legitimate organization until March 1918 and had no legal status until the passage of the Overman Act in May 1918. In fact, even the President had no general emergency powers in the organization arena until the passage of the above mentioned Act. (Clem, 1983, p. 25) Yet, beyond the WIB there was no other agency to give direction to or control over the nation's mobilization effort.

The WIB provided the first priority system. U.S. government procurement was decentralized and uncoordinated. The War Department had five, then later eight procurement offices in April 1917. Other agencies had at least one such office. Government offices bid against each other on prices, facilities and deliveries. Only by the end of the war did getting procurement offices to estimate requirements in advance even have a start. (Clem, 1983, p. 27)

> What came to be known as the priority system was destined to become the most characteristic feature of the whole scheme of wartime supervision over the industrial forces (the WIB).

> Once established , priorities left no room for chance or favoritism. With priority control established, conservation programs could be enforced, rationing programs and curtailment could be made effective, necessary new undertakings could be materially encouraged; the regulations of the Board became enforceable, and that small minority, whose tendency to disobey rules...could be brought into line without unreasonable delays. (Cuff, 1973, p. 191)

Even this reasonable program was tentative. It depended heavily on business-government cooperation which didn't always exist beyond rhetoric. Priority policies were very slow to evolve, were haphazard and opportunistic when they did. There were no legal parameters, therefore no enforcement. Hence, a priorities order meant a priorities request. This frequently resulted in non-compliance by business and breach of contract. There simply were no laws to prosecute abuses. (Cuff, 1973, pp. 193-194) Moreover, the WIB had to convince the military that centralization in a civilian agency was a worthy goal. Not until March 1918 did the WIB have any authority to determine priorities. By then there was much confusion in military procurement. The new priorities board did accomplish tightened restrictions on non-war industries, cut back unnecessary building construction and developed a preference list. However it was beset with legal burdens, had no control over transportation facilities and had to leave the responsibility for distribution to the producers themselves. The ensuing program of restrictions was beyond the enforcement and administrative abilities of the board. (Cuff, 1973, pp. 198)

> In the postwar years, central business administrators could not admit either to themselves or to the public at large the extent to which the promise of voluntary business-government cooperation was not always fulfilled, or the extent to which the failure hindered the general mobilization program. (Cuff, 1973, p. 219)

The Commodities sections constituted another critical set of administrative units in the mobilization effort. Sometimes called the "backbone" of the board, they were designed to avert the ill effects of section 3 of the food and fuel act. (Cuff, 1973, p. 150) Section 3 made it illegal for a government agent or employee including advisory employees--and that is what the WIB was--to contract for supplies in which he was in any way interested. This clause was aimed directly at destroying the informal network that the WIB had achieved. The result of this legislation was a list of resignations, the demise of the original organization of the WIB, and a distrust in business for government, but importantly, it also acted as a catalyst for greater mobilization in bureaucracy. (Cuff, 1973, p. 106)

What the Commodities sections did contribute was a first governmental policy for planning for prospective needs in advance of those needs. Provision for commodity control was critical to the war effort. The sections also provided protection for cooperative businesses, "it offered access to public sanctions and the tools of public planning which could be used for private purposes." (Cuff, 1973, p. 177)

Price fixing, another mobilization tool of WW I was not really instituted until March 1918. The blanket policy of the WIB, control through cooperation, meant that price and priority programs would be less than centralized and without cohesion. Internal organizational problems, military independence and inadequate legal foundations seriously impeded price fixing abilities of the board. (Cuff, 1973, p. 220)

When price fixing belatedly found its way into the industrial controls system it was neither uniform nor fully evolved. The Price Fixing Committee (PFC) had no legal authority and had to depend on the WIB and the trades themselves to administer price agreements. Its duties included advising on prices for basic materials, acting as a coordinating body for price policies, reviewing military contracts on request and fixing prices on commandeered goods. (Cuff, 1973, pp. 225)

Price fixing was informal and left a lot of room for misinterpretation. There seems however, to have been some sort of hard power to control industry but perhaps it was of a psychological nature rather than legal. That might explain why the relationship of the WIB and the PFC and the industries themselves was so necessarily intimate.

However clumsy the workings of the WIB were, this can be said of its accomplishments.

> ...in that short period of time the Nation moved a long way from individualism and free competition in the direction of a planned and directed national mobilization. Selective service, a "work or fight" program...industrial mobilization, priorities and allocations, price control, rationing, government control of industries that faltered--these and other measures had all been instituted. (Clem, 1983, p. 29)

However glorious those accomplishments may have been, they all but dissolved with the dissolution of the WIB at the end of WW I. The board recommended that a skeleton of staff be continued after the close of WW I, that domestic sources of key materials be developed and that small munitions industries be maintained. Not one of these recommendations was acknowledged, thus there were no economic preparedness measures taken to assure readiness for national mobilization at the onset of WW II. The U.S. relied heavily on "the pursuit of a policy of neutrality and on pious agreements outlawing war as an instrument of national policy." (Clem, 1983, p. 30)

B. WORLD WAR II

In terms of material allocations, WW II can be divided into three procedural periods: (1) early material control procedures, (2) the Production Requirements Plan, and (3) the Controlled Materials Plan.

1. Early Material Control Procedures

U.S. rearmament started in 1938. After the European declaration of war in September 1939, the U.S. was besieged with war orders that it was unprepared to handle. There were

as yet no controls in place to expedite or facilitate output of materials. The War Production Board (WPB) was the primary agency during WW II for directing industrial mobilization. It was not instituted until January 16, 1942, although it had predecessors that accomplished some mobilization. (Clem, 1983, p. 40) The powers of the WPB

> ...included: 1) General direction of the war procurement and production program, 2) Determination of the policies, plans, and procedures of the several Federal departments and agencies having influence upon war procurement and production, 3) Administration of priority grants and the allocation of vital materials and production facilities. (Clem, 1983, p. 41)

The early procedures can best be described as an incremental process. The first phase set up a series of preference ratings giving the military preference on output from civilian industry. That is to say, the military had the legal right over the civilian sector to use industry and facilities with the objective of having the finished product on hand as the need demanded. This plan focused primarily on the end item. As the volume and numbers of preferences increased, a more formal plan was developed to streamline the process. This plan, adopted in March 1941, was called the General Preference Order P-1. Priority ratings were issued to goods by military officers in departmental positions. By assigning preferences to a broad group of goods, this system was the first evidence that government production administrators were starting to focus on the materials and components of production as opposed to the end item ordered by

the military. Manufacturers were given authority to pass these General Preference Orders on to their own sub-contractors and suppliers.

The number of preference ratings increased significantly due to abuses of the grouping procedure and the ability of manufacturers to pass the preference orders down the line. Subcontractors found themselves forced to identify their output components and material requirements with end products of which they had no clear understanding. Moreover, confusion over what materials took precedence ensued. Since the same "critical materials" were universally critical to all producers of war goods, the total supply of critical materials was jeopardized by the P-1 rulings. A new system was needed to reduce the number of orders and save on material resources that were becoming scarce. This new system was referred to as Conservation Orders. These orders were assigned the letter "M" and attempted to allocate materials to specific preference orders. The outcome of this methodology was a shift in emphasis from production to awareness that critical materials were finite and, therefore, their use was restricted to the most emergent needs. M orders were created to help the Office of Production Management and the War Production Board decide who really needed what critical materials and when. It is reasonable to assume that each of these two parties felt their needs were greater that the others. (Novick, Anshen, Truppner, 1949, pp. 35-37)

As the list of "critical materials" increased, and it could not help but increase, a new control device emerged.

The next set of ratings, although initially sponsored by the army, were issued by the War Production Board and were called the Limitation Orders. These were developed to deal with the growing scarcity of labor, materials, and production facilities. The military services were exempted wholly or in part. (Department of the Army, 1959, p. 605) These orders were designed to limit or to stop the production of goods not in support of the war effort. During this same time, a series of Priority Regulations were issued to provide further guidance and direction.

The combined inadequacies of these fragmented orders resulted in the development of a more comprehensive approach to priorities and allocations. This system was called the Defense Supplies Rating Plan. This Plan started out as a voluntary system for manufacturers to match requirements with orders. These requirements would be assigned a priority which would accompany the manufacturer's purchase order that went down to his suppliers. Manufacturer's inventories and consumption of materials were starting to be monitored from information that the manufacturers provided with their allocation request. Manufacturers made their requests on a Form PD-25, "Report of Requirements for Scarce Materials." The next logical step was to make this plan mandatory for manufacturers who used more than $5000 worth of specific

critical materials during a calendar quarter. Specific critical materials-critical metals included aluminum, nickel, iron, brass, copper, and steel. These were controlled by the Production Requirements Plan. A special committee established by the War Production Board, the "Requirements Committee," consisting of representatives from the War Department, the Navy Department, the Board of Economic Warfare, the Office of Lend-Lease Administration, the U.S. Maritime Commission and the War Production Board division of Civilian Supply, was designated to relate supply and requirements of critical materials problems. (Department of the Army, 1959, pp. 103,106) A sense of order was beginning to develop.

2. The Production Requirements Plan

In June 1942, some seven months after the start of WW II, the Production Requirements Plan (PRP) was issued under Priorities Regulation No. 11. This was the first formal comprehensive materials control plan in U.S. history. The plan contained the positive features of the fragmented plans described above. Here, as in the Defense Supplies Rating Plan, manufacturers using more than $5000 worth of specific critical materials in a calendar quarter were required to request authorization under the PRP prior to purchasing specific critical materials. This system had binding precedence over the majority of the previous priorities and allocations systems. PRP functioned as a simple clearing house where manufacturers submitted their allocation requests

for a quarter to the Requirements Committee of the War Production Board. This Committee would establish distribution policies and pass the actual allocation function to the Industry Branches of the War Production Board and the military services. These two groups would actually approve the allocation requests in accordance with the distribution polices and information such as the manufacturer's current inventory status, criticality of production and past usage data. This information was submitted on the original allocation request (a modified PD-25 form). Thus a considerable amount of effort was expended to try and balance available supply with demand in the way that would most efficiently support the war effort. (Novick, Anshen, Truppner, 1949, p. 116)

3. The Controlled Materials Plan

As with previous systems, the Controlled Materials Plan (CMP), initiated on 1 April 1943, attempted to included all of the positive aspects of its predecessor, the Production Requirements Plan. The CMP retained a portion of the horizontal allocation procedure but differed fundamentally from the PRP in that it focused primarily on essential programs as opposed to specific product groups. It also limited its administrative scope to a few specific but fundamental commodities. Control of these commodities, it was thought, would provide control over the majority of other scarce materials. A great deal of time and effort was

expended to analyze the mistakes of previous material control procedures, especially the PRP. Modern management techniques such as the use of statistics and accounting procedures were incorporated into the administration of the system. This type of allocation was referred to as a vertical system. CMP can best be described as follows:

> The fundamental objectives of the Controlled Materials Plan were clear from the start. They were: (1) to assure a balance between supply and demand for the principal production materials designated under the plan as "controlled materials"--carbon and alloy steel, copper, brass, and aluminum; (2) to secure that balance by a coordinated review of military, export, and essential civilian programs in terms of their controlled material equivalents and by adjustments wherever necessary, to yield that total commitment of our production resources calculated to secure maximum output for world military victory; (3) to schedule production for each approved end-product program in order to secure the maximum level of balance output at all levels of production from metal mill to final assembly plant; (4) to maintain continuing control over production and over the distribution of materials required to support approved production levels in all parts of the economy; and above all (5) to cut down the size of the total war production program to realistic proportions by expressing all projects in addable currency common to virtually all programs--steel, copper, and aluminum. (Novick, Anshen, Truppner, 1949, p. 166)

Theoretically, in a vertical allocation system, materials would be allocated to a prime contractor who then would match suppliers with necessary quantities of materials. (Novick, Anshen, Truppner, 1949, p. 134) Material requirement requests or allotment requests were divided into 17 categories:

1. carbon steel
2. alloy steel
3. brass mill copper products
4. wire mill copper products

5. 4 shapes of copper-brass alloy
   sheet and strip
   rods, bars
   wire, tubing, and pipe
   foundry products
6. 9 aluminum classes
   rod, bar
   wire and cable
   rivets
   forgings, castings
   rolled shapes
   sheet and strip
   tubing
   ingot and powder
   unclassified. (Novick, Anshen, Truppner, 1949, p. 169)

The prime contractor would combine his and his suppliers' requirements and submit these to the procurement agency from which he was awarded his contract. The procurement agencies would in turn total their contractors' requests and submit these by program to the controlled-material branches and the Requirements Committee of the War Production Board. The controlled material branches would look at the requests, production schedules and lead times, assess projected supply, and recommend specific allocation plans to the Requirements Committee. The Requirements Committee would then make the final allocation decisions. These decisions were forwarded to the procurement agencies who would pass them on to the prime contractors, who would then pass them down to his vendors. The material suppliers required their customers to include the agency program number on each purchase order in addition to allocation information. The controlled-material agencies

required that the material suppliers keep track by agency program numbers, all orders and shipments.

The vertical system just described applied to the majority of war-related products. These products were classified as Class A products under CMP. Horizontal allocation, similar to that used in the PRP, applied to another group of products that became known as Class B products. Class B products were defined generally as off-the-shelf-type items or items whose ingredients would not fit into the vertical system of allocation. Class B product manufacturers submitted their allocation requirements directly to the specific industry branches of the War Production Board.

C. KOREAN WAR

Title I of the Defense Production Act of 1950 authorizes the President of the United States to set priorities and allocations to ensure American national security. Executive Order 10480 dated 18 August 1953, established two systems to accomplish this task: (1) the Defense Priorities System, and (2) the Defense Material System. (Clem, 1983, p. 91)

1. The Defense Priorities System

The Defense Priorities System (DPS) worked by using two general priority guidelines, "DX" rating and "DO" rating. "DX" ratings are used only for critical national programs approved by the President. "DO" ratings are given to all other Defense Programs. The hierarchy of order is simply that

"DX"-rated programs take precedence over "DO"-rated programs and "DO"-rated programs take precedence over un-rated programs.

2. The Defense Material System

The Defense Material System (DMS) works in conjunction with DPS to allocate critical materials to national defense programs. The system includes a program whereby material producers agree to "set aside" a specific percentage of their output based on past-production rates, for national defense use.

Specifically, material producers, such as a foundry, would set aside a certain percentage of its output to be allocated to a Defense contractor or subcontractor. This allocation process would follow the DPS priority system where the foundry would fill all its "DX" rated orders first, then "DO," and then un-rated DoD orders (usually a DoD contractor's purchase order). The foundry would fill the orders in this fashion up to the maximum limit of its set-aside percentage. It would then be free to fill orders in any way that the company saw fit. In this way, material producers would not be unfairly called upon to provide materials to DoD but rather the DoD business would be shared among all suppliers. During a partial mobilization or simply during a time of accelerated DoD orders for war, material suppliers may have pre-arranged formal or informal agreements with their customers. It may be considered bad business to supply DoD and not to supply their

customers with the material it needs. If the material supplier and his customers know that the material supplier only needs to supply a certain percentage and that this is a national defense program, the status quo business environment may not be severely altered. The DMS set-aside program covered the following materials: steel, aluminum, copper, and nickel alloys.

One's observations about the history of industrial mobilization might compel one to believe that WW I and WW II might have been won more quickly and less expensively and that better planning might have expedited the victory. This might be so, but it is well to remember that in spite of the incredible challenges that both wars presented, both wars were victories and that the challenges confronting planners during those wars aren't all that different from today's challenges--"modern wars are fought, not by armies, but by nations, and that the whole moral, spiritual and physical energy of the Nation must be summoned to the struggle." (Clem, 1983, p. 12)

IV. THE DEFENSE PRIORITIES AND ALLOCATION SYSTEM

On August 29, 1984 the Defense Priorities and Allocation System (DPAS) was established by direction of the Department of Commerce, the Office of Industrial Resource Administration. This system was essentially a combination of the DPS and DMS. These former systems were thus cancelled and the new set of regulations covering DPAS were published in the Code of Federal Regulations, specifically, 15 CFR 350.

> The goals of the DPAS are (1) to assume the timely availability of industrial resources to meet current national defense requirements and (2) to provide a framework for rapid industrial mobilization in the case of national emergency. (U.S. Department of Commerce, 1984, p. v)

A. REVIEW OF DPAS REGULATIONS

A brief review of the governing directives of DPAS is appropriate because of the pervasive affect of this system. 15 CFR 350, the basic directive, will be reviewed along with the applicable requirements of the Federal Acquisition Regulations (FAR), and an operating regulation, the Defense Logistics Agency manual, DLAM 8300.1.

1. 15 CFR 350

Operating in an almost identical fashion to the DPS, DPAS uses the same "DX" and "DO" priority ratings. The same precedence structure is maintained in that "DX"-rated orders take precedence over "DO"-rated orders, and "DO"-rated orders

take precedence over un-rated orders. A similar set of program identification symbols are used to identify specific authorized programs. Appendix A is the current list of authorized programs. All orders of the same rating, i.e., "DX" or "DO," or un-rated orders have the same precedence regardless of individual programs. This helps to eliminate inter-service rivalries and helps to limit the tendency of assigning high priorities to all material purchase orders. In this case the same priority ratings are passed down from prime contractor all the way to the lowest tier. Each tier would have an array of "DX," "DO," and un-rated orders. As with the DPS, the material producers would be required to fill the "DX" rated order first, up to a specified amount of material in a given time interval, then "DO," then un-rated orders. Under DPAS, the set-aside program applies currently to four general commodities, steel, copper, aluminum, and nickel alloys. This could be expanded to include other critical items during an emergency. A sample of the set-aside percentages are listed in Appendix B.

In the case of conflicts, the Department of Commerce has the legal authority to issue "Rating Authorizations, Directives, Letters of Understanding, Set-asides, and compliance documents" (U.S. Department of Commerce, 1984, p. 5) to civilian and other government agencies. It should be noted that a Department of Commerce Directive could take precedence over a "DX"-rated order.

2. Defense Logistic Agency Manual 8300.1

The Defense Contract Administration System was chosen to review because of the broad interface with both the DoD contracting organization that assigns priority ratings to contracts and the regional and field Defense Contract Administration System offices. These offices are Defense Contract Administration System Region (DCASR) and Defense Contract Administration System Management Area (DCASMA). They directly review the actions of DoD contractors in their region and local areas.

The DCASR and DCASMA use the Defense Logistics Agency Manual(DLAM) 8300.1, Production Manual For Contract Administration Services for its daily operating manual.

In developing this manual, the Defense Logistics Agency (DLA) uses as its authority, the authority delegated from the Department of Commerce down to the military agencies including DLA. The basic references DLA uses as a foundation for this manual are: 15 CFR 350, FAR, and DoDD 4400.1 (DoD Priorities and Allocation Manual).

The DLAM 8300.1 covers the basic facets of the DPAS as discussed in section (1) above, but more importantly this publication addresses the actual procedures used at the field level where the majority of the DPAS actions would take place. Actual procedures are delegated to the local DCASMA where usually a Civil Service employee (GS-11) working under a Industrial Specialist (IS) job classification, would act as

the first point of contact between the contractor and the government for DPAS-related issues. The IS would also function as the eyes and ears of the government in terms of ensuring the contractor's compliance with the DPAS.

In the particular case of materials allocation covered under DPAS, the IS would check to see that the contractor has placed rated orders, i.e., "DX" or "DO," in accordance with the contract in sufficient time to meet the production schedule. The IS may spot-check this at each level of the contracting chain to ensure that correct ratings have been passed down and that the individual contractors and suppliers are in compliance with the DPAS. For large contracts the IS may be required to provide material requirements data to the Procurement Contracting Officer just prior to contract award or during actual contract performance. The IS will keep a ledger for the receipt and acceptance of rated orders for the purpose of audit. (U.S. Defense Logistics Agency, 1986, pp. 5-21)

Finally, the IS will be the first point of contact to assist the contractor at any time with expediting of problematic materials. This assistance may be simply a call to the contractor's supplier to explain the requirements of the DPAS, or acting as liaison between the contractor and the Administrating Contractor Officer (ACO) to work out a substitute material. Assistance may involve helping the contractor fill out a Request For Special Priorities

Assistance (ITA-999) which will ultimately be acted on by Department of Commerce.

3. Federal Acquisition Regulation

The Federal Acquisition Regulations (FAR) Subpart 12.300 requires federal contracting officers to adhere to the regulations of DPAS. The FAR provides a brief background for the contracting officers concerning DPAS. A procedures section itemizes the action that a contracting officer must take which includes a list of items that a rated order must include. These requirements are listed below:

1. a priority rating of "DO" or "DX" and a program identification symbol.
2. a required delivery date.
3. a signature of an individual authorized to sign rated orders. (U.S. Department of Defense, General Services Administration, and National Space and Aeronautics Administration, 1986, p. 12-4)

Additionally, the FAR requires agencies to provide contracting officers with guidance concerning DPAS and requires contracting officers to report any DPAS violations to the Department of Commerce. Finally, the FAR requires that contracting officers put the provision, 52.212-7, Notice of Priority Rating for National Defense Use, into every solicitation with a rated order and to include the clause, 52.212-8, Defense Priority and Allocation Requirements, into all contracts with rated orders. (U.S. Department of Defense, General Services Administration, and National Space and

Aeronautics Administration, 1986, p. 2-20) Copies of the official provision and clause are included in Appendix C.

B. DPAS AT THE DEFENSE CONTRACT ADMINISTRATION SERVICES

In the 1960s, DoD organized the Defense Contract Administrative Services (DCAS). This organization was to provide a single and more consistent DoD contract administration organization for all DoD contracts regardless of Service. DCAS is organized on a geographic basis with nine regions scattered throughout continental United States and its territories. These regions, called Defense Contract Administrative Services Regions (DCASRs), are further broken down by geographic areas called Defense Contract Administrative Services Management Areas (DCASMAs) and Defense Contract Administrative Services Plant Representative Offices (DCASPROs). DCASMAs and DCASPROs are the contractors' first point of contact for contract administration and the DoD's primary representative to industry for day-to-day contract administration. (U.S. Department of the Air Force, pp. 16-17)

This section is based on interviews with personnel at Defense Contract Administrative Services Region (DCASR) Los Angeles and Defense Contract Administration Services Management Area (DCASMA) San Francisco. An Industrial Specialist (IS) was interviewed at both the DCASR AND DCASMA.

1. DPAS at a DCASR

Ms. Jessie M. Jackson, Industrial Specialist (Staff), was interviewed at the DCASR Los Angeles on 17 October 1989. She is part of the Administration-Production Branch of the Directorate of Contracts. In describing her daily duties, Ms. Jackson stated that she works as a consultant to the Industrial Specialists (IS) in her region. There are 12 Defense Contract Administration Offices (CAOs), referred to as field offices in Ms. Jackson's region. Ms. Jackson came from a field office and so she is able to provide good insight. She has worked in the industrial/production area for most of her 30 years of government service and has seen the many changes to the Defense Production Act.

Ms. Jackson also collects management information from the CAOs for collation and forwarding to DLA headquarters. Management information includes the number of ITA-999 forms submitted, the number of Form DD 691 requests for rating authority for production or construction equipment, and the number of persons both government and contractor personnel who were given government sponsored DPAS training. This information is then collected from the various regions by DLA headquarters for inclusion in a nation-wide management information report.

Ms. Jackson is part of the Directorate of Contracts, Administration-Production (AP) branch. In the AP branch there is at least one other person involved with DPAS in some

fashion. That person is assigned the task of Industrial Preparedness Planning (IPP). This job is currently vacant and is being handled by Ms. Jackson. One of the IPP responsibilities is to assist the field offices in their collection of DD Form 1519 data on a consultant-type basis.

At the time of my visit, Ms. Jackson, as part of the IPP job she had assumed, was involved in a mobilization exercise that had started the day prior to my visit and would continue for the rest of the week. When asked, Ms. Jackson informed me that they had these types of exercises about three or four times a year.

Because of Ms. Jackson's past experience, I frequently asked her to relate what would take place at the field level by the IS who deals directly with the various contractors, sub-contractors, and suppliers.

When asked what the field IS normally does, Ms. Jackson stated that the field IS goes on pre-award surveys, monitors the contractor's production control, assists with shipping problems and monitors contractor's purchases (for example to ensure that purchase orders had been made for required production materials and that the appropriate "DX" or "DO" rating was assigned).

When asked if she got involved with any expediting, Ms. Jackson stated that expediting is done primarily by the field IS. The field IS will assist the contractor in filling out the ITA-999 and attempt to solve the problems at his level

by contacting the contractor's supplier, or the Defense Contract Administration Office closest to the supplier. During this process, the field IS may contact Ms. Jackson for advice and guidance. If the field IS is unable to solve the problem at his level, Ms. Jackson will formally get involved, and if she cannot resolve the issue, the ITA-999 may be referred to Department of Commerce (DoC) who has legal authority under DPAS and the Defense Production Act. Ms. Jackson stated that most of the expediting was handled at the field level. She was not aware of any recent interventions by the DoC.

When asked how many expediting actions Ms. Jackson referred to her management information documentation which provided monthly figures for her region. A total of 102 ITA-999 forms were processed in 1988.

Ms. Jackson indicated that the system is designed to operate in the type of economy we have today. It is inferred that Ms. Jackson means that the DPAS is designed to operate in a peace-time mixed-market economy.

Ms. Jackson showed me a management information report for her region. This information was passed to DLA headquarters for consolidation with the other regions.

When asked how the set-aside program operates, Ms. Jackson stated that not much emphasis is placed on the set-aside program now. There have been no reports made on it for about four years.

When asked if many of the contractors in her region complain of any shortages, or hard-to-get items, components, or materials, Ms. Jackson stated this is usually best evaluated at the field level. Nevertheless, Ms. Jackson indicated that from her experience, castings, titanium, and some electronic items were problematic and should therefore be added to the four critical metals presently under DPAS.

When asked how do you monitor rated orders of your contractors, sub-contractors, Ms. Jackson stated that this usually done at the field level using an automated system called the Production Administration Delinquency Report (PADR). Ms. Jackson did not have a copy to give me, but she showed me a report that contained significant detail for me to conclude that the government was keeping good close watch over the rated orders. This report is called "Requested Energy Crisis Production Status" and is provided in Appendix D. Un-rated orders are monitored on the PADR.

When asked how do you track or review the scheduling of rated orders, Ms. Jackson stated that they do not.

When asked what feedback system do they use, Ms. Jackson stated that this is usually done at the field level using the PADR. Additionally, when a contract involves a new defense contractor or a contractor with a history of delivery or compliance problems, the field IS can check to ensure the contractor is or has the capability to comply with the DPAS by

using Appendix C to the DLAM 8300.1. This comprehensive check list is provided in Appendix B.

When asked if contractors were tied to her electronically to provide her with information, Ms. Jackson stated that they were not. Ms. Jackson indicated that the field level utilizes the PADR to trace order for timeliness to ensure that items are on schedule. However they will only appear when they are delinquent and then show up on the PADR.

Since contractors dislike negative visibility according to Ms. Jackson, there have been no legal problem that she is aware of, e.g., contractor refusing to participate.

According to Ms. Jackson, DPAS is self-executing as it is meant to be, and with the help, plus oversight by the field ISs, and support of the various DCASRs and procurement offices, the system operated by itself.

Ms. Jackson stated that the IPP person also works on DPAS to a limited extent. Ms. Jackson indicated that prime contractors are required to train their sub-contractors and suppliers. However, the government will provide training to the prime, his sub-contractors and suppliers when any of these are new to government contracting. Ms. Jackson stated that usually the local IS will send out a letter of introduction to the new government contractor and offer DPAS training services to the new contractor. This training has been given at a government location or on the contractor's site. Ms. Jackson

referred to a management report that demonstrated that provision was made for 240 persons under the Los Angeles region to receive training in DPAS from government personnel in 1988. This training consisted primarily of showing a professionally done video on DPAS. Persons trained include both government personnel and contractor. However, according to Ms. Jackson, it is primarily made up of contractor, sub-contractor and supplier personnel.

Ms. Jackson felt that generally the contractors have a positive attitude about DPAS. In many ways contractors benefit from the system because DPAS can be used to expedite hard-to-get material. Ms. Jackson presented a copy of a speech given by the DPAS coordinator of a government contractor. The speech showed the importance that this particular firm places on DPAS and the widespread effect DPAS has on a company. Ms. Jackson also indicated that the DCASMAs worked with DPAS frequently and that the field level IS is critical and very much involved. She does not use DD 1519 forms in her work. The IPP person does work with these a little at the regional level. However, the IS at the field level works with the local contractors to assist them in submitting a DD 1519 form.

Ms. Jackson has not heard of any rated order being rejected. Rated orders are monitored at the field level using the PADR. Ms. Jackson feels that the current DPAS is capable of expanding to accommodate increased industrial mobilization

levels or stages. However Ms. Jackson's main focus and experience was on the operation of the system in a peace-time environment. When asked if she felt rated orders are given priority, Ms. Jackson emphasized that by law they have to be.

According to Ms. Jackson, DoC converted the DPS/DMS to DPAS in 1984 because the DPS/DMS was hard to understand. It was written in legal language and most of the contractors did not understand it. DPAS is written more clearly and in simple terms. Unlike DPS/DMS, the field activities were receiving frequent inquiries from contractors on how they can implement the program at their company. DPAS is just easier to understand for the contractors.

As a final note, Ms. Jackson mentioned that the NAVSEA Shipbuilding Support Office located at the Philadelphia Naval Shipyard, publishes yearly a publication titled "Manufacturing Lead Times." This publication is used by the ISs and personnel involved in DPAS and IPP.

2. DPAS at a DCASMA

Mr. David Degl'Innocenti is an Industrial Specialist employed at the DCASMA San Francisco, located at San Bruno, CA. He was interviewed by telephone on 23 October 1989. Mr. Degl'Innocenti stated he is the DCASMA's Armed Service's Production Planning Officer (ASPPO). In this capacity he works on Industrial Preparedness Planning (IPP) and DPAS. DPAS occupies about ten to 15 percent of his time. At DCASMA San Francisco there are other ISs in the production branch and

a few contract management assistants who touch on DPAS in their positions, but Mr. Degl'Innocenti stated that he is the main point of contact at DCASMA.

When asked about material expediting, Mr. Degl' Innocenti stated he most recently (this year) worked on expediting specialized integrated circuits. The problem is significant in that there is no other source for these particular high tech chips. The problem appears to have been with the supplier who for various reasons was unable to deliver specialized IC chips that could pass the prime contractor's quality/performance specifications. Mr. Degl'Innocenti did relate an example where he got involved in a case where a government contractor working on a "DX"-rated aerospace item needed to have the item tested. The item had been scheduled with the only testing facility available for this size of item, however the project missed the scheduled date. The item was ready for test again, but the test facility was scheduled for use by a commercial business and the testing facility was not going to adjust the scheduled to accommodate the government contractor. Mr. Degl'Innocenti got involved and told the testing facility that the item was a "DX"-rated item and federal law required the testing facility to schedule the item before other "DO"- or un-rated items. The facility complied, explained to their commercial customer that the "DX"-rated item must come first, and the problem was resolved. When asked if DCASMA is tied electronically to

their headquarters, Mr. Degl'Innocenti responded that they are connected through the management information system, facsimile, and electronic mail, to the Region and various other DCAS offices. When questioned about the set-aside program, Mr. Delg'Innocenti was familiar, but indicated that they did not operate the set-aside program at DCASMA San Francisco.

In terms of contractors complaining of any shortages, hard-to-get components or materials, Mr. Degl'Innocenti stated that IC chip packaging was mentioned by IC chip manufacturer because this packaging is only made in Japan and Korea. When asked about forgings or high tech materials, Mr. Degl' Innocenti stated that the problem with these items appears to be lead-time-related. Additionally, when asked if he thought that DoC should add items or materials to the four critical metals presently under DPAS, Mr. Degl'Innocenti indicated that IC packaging would be one option.

When asked about rated orders, Mr. Degl'Innocenti stated that the use of the Production Administration Delinquency Report (PADR) is a centralized management system that is available at DCASMA, DCASR, and where the accounting and bill paying is accomplished, and it tracks all rated and non-rated orders. The Requested Energy Crisis Production Status report tracks "DX"-rated orders also. Additionally, un-rated orders are also tracked on the PADR. When asked if he tracks or reviews the scheduling of rated orders, Mr.

Degl'Innocenti responded that he does not on a regular basis. He indicated that there are just too many. There is no way to see if a rated order is on schedule, or components for the rated order have been ordered because they do not know until it is appears on the PADR as a delinquent item. If the contract is a high visibility contract, DCASMA or the Program Office may develop special reports for the contractor to submit. He indicated that they do an on-site review of our larger contractors once a year. This review consists of reviewing the contractor's manufacturing scheduling and purchasing system. At this time they will check to see if the rated orders are being passed down to the sub-contractor and supplier tiers, and that purchase orders are sent out in a timely fashion. Mr. Degl'Innocenti was not aware of any legal problems, for example, vendors refusing to participate. Mr. Degl'Innocenti was not aware of any rated order being rejected. Additionally, Mr. Degl'Innocenti related that he sometimes has procedural errors with new or unfamiliar DPAS users. One that he mentioned concerned the provision for combining un-rated and rated orders to achieve a minimum order quantity. This is allowed but the different items must be itemized to show which components go to the "DX" and which go with the un-rated order. One firm did not separate the two. The problem for the supplier is that this gives or could give the contractor an unfair advantage because the contractor

could receive the un-rated components before a competitor who has his order in first.

Asked about electronic data transfer (EDI) with any of the local contractors, Mr. Degl'Innocenti indicated that there is no formal system. They have a facsimile capability, however.

When asked if he thought that DPAS is really self-executing, Mr. Degl'Innocenti, like Ms. Jackson, thought that the DPAS is self-executing.

Concerning training of local contractors/sub-contractors and suppliers, Mr. Degl'Innocenti stated he tries to get out into the field to meet with contractors and provide training at least once or twice a month. Mr. Degl'Innocenti seems to think that the contractors are generally positive about DPAS.

Mr. Degl'Innocenti indicated he feels that DPAS is capable of expanding to accommodate increased industrial mobilization levels or stages but that new people would have to be trained. There would be a time lag to get people trained. He mentioned that recently he was visited by a group who were part of the National Defense Executive Reserve, who told him they are the ones who would do some of the allocation type work in the event of mobilization. One of the men in this group had both government and contractor experience.

When asked if he felt rated orders are given priority, Mr. Degl'Innocenti felt that they are.

One of the problems Mr. Degl'Innocenti mentions is that the field ISs usually do not hear back concerning the results of the ITA-999. This is bad for morale in particular, but also it indicates that the follow-up program is incomplete. Additionally that the system both from the contractor point of view and the government point of view works not to cure the cause of a material shortage but rather treats the symptoms. Research indicated that usually the ITA-999 were processed in a timely manner. Mr. Degl'Innocenti indicated he was given ten days but usually would have them out in five days. Mr. Degl'Innocenti estimated he processes 10-12 ITA-999 per year. The question remains how many ITA-999s resulted in successful conclusions.

Mr. Degl'Innocenti qualifies the DD form 1515 as one of his main functions of his Industrial Planning Preparations (IPP) task. Concerning the DD Form 1519, Mr. Degl'Innocenti noted with concern that the major buying commands figure out what type of production they think they need to support specific mobilization scenarios. Mr. Degl'Innocenti tries to get the contractors to sign up for production to match this estimate. This is a voluntary program on the part of the contractor. Mr. Degl'Innocenti indicated that the estimated production figures are often not sufficient to keep a line open, plus it is very hard to get the contractor to complete the DD 1519 for free when they are taken to task by the government for numerous small paperwork requirements related

to ongoing contracts. It is difficult to reprimand or dog a contractor on one hand, then go out and ask him to do work for you for free on the other. Mr. Degl'Innocenti also indicated that the 1519 estimates required by the major buying activities frequently changes, which reduces the credibility of the system to the contractors.

It is interesting to note that at the time of the interview Mr. Degl'Innocenti was involved in a Residual Capacity Assessment to assess the damage done to major DoD contractors in the San Francisco area by the 17 October 1989 earthquake. Although he was not able to relate the result of the assessment, he did indicate that some of the same start-up problems that faced local officials and agencies would be similar to what the DoD federal government would encounter in a mobilization environment.

One idea Mr. Degl'Innocenti had was to combine the data on the 1519, figure out what materials are needed to produce the stated production goals, then establish the approximate supply data of available resources and set up a recourse allocation system of available supply to the pre-established DD 1519 production requirements. This sounds like a feasible idea for the following reasons: it defines and coordinates real mobilization planning; it provides a complete picture and a first set of plans to use while the nation is gearing up. Additionally, the set-up process itself would provide an excellent test of the systems and a great learning

tool for those involved. These, of course, would have to be updated whenever there were changes to the DD 1519 requirements. It appears that these systems are not presently tied together but could be and perhaps should be.

Mr. Degl'Innocenti's and Ms. Jackson's commentaries lead me to conclude that DPAS has no formal process for recommending items to DoC so they be added to the DPAS critical list or even to the NDS.

V. ANALYSIS

A. CONCERNS ABOUT THE DEFENSE PRIORITIES AND ALLOCATION SYSTEM

1. Changing U.S. Industrial Base

The U.S. industrial base is different today than it was when DPAS was first adopted. DPS and DMS, upon which DPAS is based, were developed in the 1950s. America's industrial base has changed since then. The U.S. has been shifting from an industrial-based economy to a service-based economy. One of the primary concepts of DPAS, that of control of national production based on control of the four basic metals, would loses some of its validity.

Two pertinent comments from the 1980 report of the Defense Industrial Base Panel of the House Armed Services Committee highlight key issues affecting DPAS.

> The defense industrial base is unbalanced; excess production capacity at the prime contractor level is not matched by capacity at subcontractor level. The United States is becoming increasingly dependent on foreign sources for critical raw materials and for some specialized components for military equipment. (Vawter, 1983, pp. 69-70)

One educator in the field of production management summarizes the current trend:

1. Foreign manufacturers are building factories on U.S. soil at unprecedented rates.

2. Foreign manufacturers are joining with U.S. manufacturers to build factories in the United States and become partners in producing products and selling them in world markets.

3. Foreign manufacturers are producing completed products in their home counties that are then sold in the United States under the brand names of U.S. manufacturers. (Gaither, 1987, p. 848)

These circumstances create a more complex and dynamic industrial environment than that encountered in the 1950s upon which the current DPAS is based.

Fortunately, as material management has become more complex and dynamic, so has industry's ability to deal with these issues. Material management and production control has benefited from the U.S.'s attempt to regain its productive edge during the 1980s. Systems such as Material Requirements Planning (MRP) and Just In Time (JIT), are designed to more accurately accomplish production planning which incorporates required-delivery dates and quantities of materials needed. The World Economy has essentially forced U.S. production companies to use their resources and operating capital more efficiently, including holding inventory to a minimum by having it arrive just as it is needed in the production cycle. This helps with resource allocation because it provides a more accurate required-delivery date (RDD) and quantity figure, while reducing the volume of scarce resources sitting idle in companies warehouses.

Additionally, reduction in work in process inventory (WIP), scrap, and improved quality of final product, reduce the need for raw-material requirements. New operating-production application software programs based on MRP and JIT

provide faster more accurate inputs to the allocation systems and through modern telecommunication techniques such as electronic data interchange (EDI), or even a simple facsimile system, these requirements could be sent to a centralized allocation agency such as DOC or FEMA where national requirements could be collated. These systems could then be integrated into the agencies mainframe computer where, combined with supply data sent in from producers, could all be run against an automated allocation algorithm and specific allocations could be sent back to suppliers, manufacturing concerns, and DoD.

The task is formidable but it is possible. It would, as we have seen in WW II, take a long time to develop. In the event of mobilization, DPAS may work for a short time to allocate resources to selected "DX" programs, but as shown in WW II, as the list of "DX," or high priority programs increases, the effectiveness of the allocation system decreases and another control system is required.

Industry executives are putting more thought into strategic materials and the effect that U.S. dependence on foreign sources has on the corporate-business strategy. One corporate Vice President for The Diebold Group, Inc., describes a computer software system that major manufacturers would find essential.

> A decision support system is required that identifies, quantifies, prioritizes and evaluates critical supply issues and integrates them into the company's strategic business

planning. Such a system requires a joint effort by the company's information technology, purchasing and strategic planning functions. (Webber, 1988, p. 62)

Industry is identifying, quantifying, prioritizing, and integrating the acquisition of critical materials, providing useful research data, new ideas and is evolving corporate plans ready to work with limited resources, and plans to work within or around these limited resources thus making the transition to increased material allocations during mobilizations easier.

Additionally, these forward-looking companies fundamentally will have less vulnerable products, but in terms of DPAS and allocation procedures, these companies will have developed useful decision support systems (DSSs) that could be expanded by the central allocation agency, or exported for use by other companies during mobilization.

Even though the industrial environment is more complex and dynamic, the tools available to deal with this changing environment are being developed by forward-looking companies. Use of DSS may provide a leg up as the nation moves to a full-scale mobilization posture and increased control over scarce resources.

2. Changes in the Prime, Vendor, and Supplier Tier Structure

The current DPAS is essentially a combination and simplification of the earlier DPS and DMS. The DPS/DMS was a carryover from WW II and Korea. Changes in the structure of

the defense industrial base from the 1940s and 1950s to the 1980s and 1990s may cause disturbances in the DPAS as it is currently written. If that structure is altered it is logical that so will function alter.

Numerous studies have been done to analyze the defense industrial base. One of the most recent is the one completed by The Center for Strategic and International Studies (CSIS), Washington, D.C. in 1989.

One of the key findings of this report is that the defense industrial base has shrunk significantly in the 1980s. For the purpose the study, CSIS limited the defense industrial base into manufacturers of products for 215 critical defense sectors. The finding was that "In 1982, there were 118,489 firms that provided goods to the DoD in the relevant defense sectors. In 1987, only 38,007 firms in those sectors provided good to DoD." (Blackwell, 1989, p. 31) Additionally, this reduction occurred during a time when the total number of firms in these manufacturers sectors serving both military and civilian customers rose from 98,659 in 1972 to 150,000 estimated for 1987. The report also pointed out that the DOD procurement budget went from $43.271 billion in 1982 to $80.744 billion in 1987. (Blackwell, 1989, pp. 31-32)

The report highlighted additional concerns.

> Some products no longer have more than one domestic provider, including nuclear projectiles, depth charge components, parachute recovery systems, some specialized marine vessels, tanks, several and various textile and clothing products. More than 280 product groups lost

> producers in those four years--more producers than those continuing to do business with the DoD--indicating an ominous trend for the near future. (Blackwell, 1989, pp. 34-35)

Additionally, in terms of the structure, the CSIS report made the following comment:

> Although the raw materials, basic supplies, and components and sub assemblies tiers have either remained stable or have become more competitive since 1947, the complete systems tier has become dramatically more concentrated in the post World War II era...it is clear that firms involved in making ships, planes, and tanks for DoD are facing less competition than those making the materials, hardware, and components that go into those end items. (Blackwell, 1989, p. 35)

Utilizing data from the U.S. Department of Commerce's Census of Manufactures for 1954 and 1982, it is clear that the total number of manufacturing establishments has increased significantly. This information is presented in Table 1. Notice also that the following groups show a decline in the number of establishments: tobacco products, texitiles, apparel, lumber, furniture, and leather products. This is not necessarily representative of the numbers of firms or companies. When compared to Table 2, which shows the number of employees in each industry group, a similiar decline is observed. One explanation for this anomoly is that these particular industries have replaced numerous manual tasks with labor-saving devices. This move to automation will have little impact on industrial preparedness planning in terms of material management but should be considered as part of the overall industrial preparedness planning process. Neverthless, during a national mobilization, the majority of

TABLE 1

NUMBER OF MANUFACTURING ESTABLISHMENTS

SIC	INDUSTRY GROUP	1982 Total Nr	1982 With >20 Employees	1954 Total Nr	1954 With >20 Employees
20	Food Products	22,130	10,681	42373	13,649
21	Tobacco Products	163	107	627	291
22	Textiles	6,630	3,653	8,054	4,846
23	Apparel	24,391	10,907	31,372	13,280
24	Lumber	32,984	6,313	41,484	6,387
25	Furniture	1,003	3,629	10,273	3,012
26	Paper	6,381	4,090	5,004	3,177
27	Printing	53,406	10,871	32,530	6,054
28	Chemicals	11,901	4,779	11,074	3,959
29	Petroleum	2,322	848	1,262	592
30	Rubber	13,449	5,975	3,845	1,482
31	Leather Products	2,735	1,313	4845	2,267
32	Stone/Glass	16,545	4,753		4,478
33	Primary Metals	7,061	3,909	6,170	3,398
34	Fabricated Metals	35,560	13,642	22,042	7,382
35	Machinery	52,912	14,264	0	0
36	Electric/Electronic	16,453	7,834	31,619	10,214
37	Transportation Equipment	9,443	3,800	5,349	2,318
38	Instruments	8,045	3,015	3,141	984
39	Misc Manufacturing Industries	15,871	3,568	14598	3,855
NA	Auxiliaries	9,676	5204		
Total	Total	358,061	123,163	286,814	90,470

TABLE 2

NUMBER OF EMPLOYEES

SIC	INDUSTRY GROUP	1982 Number	1954 Number
20	Food Products	1487700	1646591
21	Tobacco Products	57900	94863
22	Textiles	717400	1027802
23	Apparel	1189000	1190064
24	Lumber	576400	645936
25	Furniture	436000	340694
26	Paper	605600	527710
27	Printing	1291800	803482
28	Chemicals	872600	733896
29	Petroleum	151600	183339
30	Rubber	681700	338493
31	Leather Products	199800	356578
32	Stone/Glass	531500	
33	Primary Metals	854100	1169331
34	Fabricated Metals	1459700	1060431
35	Machinery	2188700	
36	Electric/Electronic	1914500	2441736
37	Transportation Equipment	1595900	1705501
38	Instruments	623600	272586
39	Misc Manufacturing Industries	382600	614644
NA	Auxiliaries	1276000	
Total	Total	19094100	15645491

these establishments would be converted to war production. This increase in the total number of establishments will make it harder to coordinate production and allocation of resources than experienced in WW II.

In a 1981 Defense Science Board report, Report Of The Defense Science Board 1980 Summer Study Panel On Industrial Responsiveness, the Board commented on the decrease in the number of subcontractors and suppliers serving DoD and the various areas where entire industries such as foundries have closed down. Table 3 from the Defense Science Board Report shows the sectors that have limited numbers of firms serving the defense industry.

TABLE 3

LIMITED SUPPLIES

ITEM	NO. OF SUPPLIERS
Aluminum Plate	2
Aluminum Tubing	2
Titanium Sheet	3
Titanium Wing Skins	2
Titanium Extrusions	1
Aerospace Fasteners	Less than 24 out of hundreds of fastener companies
Air Frame Bearings--Special Ball	1
Needle Bearing Bearings	2
Mil. Spec. Qualified Connectors	3
Aircraft Landing Gear	3
Radomes	2
Image Converter Tube	1
Periscope Lenses	2
Optics Coatings	1

In most cases, all these suppliers are at capacity and have substantial backlogs. (Defense Science Board, 1981, pp. 48-49)

Another change in the structure of the defense industry is the change in the make-up of the large contractors (Defense Science Board, 1981, pp. 46-51). The Board commented:

> The large prime contractors and major subcontractors are no longer stand-alone organizations devoted primarily to defense business. The companies have become elements of large multi-product, multi-market organizations,.... (Defense Science Board, 1981, p. 7)

Subcontractors, suppliers, and vendors of material and components are apt to shy away from defense work, while emerging companies will seek defense work but turn to commercial work after they have become established, outgrown government incentive programs, or become tired of excessive government regulations. The large prime contractors, on the other hand, although not under the intense competition that the lower tier subcontractors are under, appear to be under new pressures of profitability and government oversight. This contractor turnover tends to undermine the stability of the DPAS because each new player must be trained in the requirements and procedures of the system. This instability could prove disruptive during times of mobilization.

3. General Concerns About DPAS

There appear to be no regional or local plans to expand the DPAS in the event of mobilization. These plans would be in the form of increased personnel, training for these personnel, additional automated data processing facilities, and formalized procedures.

DPAS is designed as a self-executing system which makes sense in a peacetime environment. Nevertheless, there appear to be no plans or strategies at the regional or local level to direct the management of the DPAS into a proactive role in the allocation of scare materials and into a more proactive role as an expediter of scarce materials and components.

As suggested by Mr. Degl'Innoceti, there may be opportunities from the integration of IPP using the DD Form 1519 and DPAS. Allocation of resources could be accomplished in advance of a mobilization based on the production agreements/schedules detailed on the current DD 1519s. If this were done, it could be a prototype for a larger allocation system to be used to cover national allocation while serving as a starting point during the initial stages of an industrial mobilization.

It appeared from talking to both Mr. Degl'Innocenti and Ms. Jackson, that there is no formal process for field personnel to recommend items through their chain of command to be added to the DPAS critical item list or even to the National Defense Stockpile (NDS). These people are at the level where they can see the problem best.

Rated orders are not tracked during production except by exception basis when they appear on the PADR. The DCAS PADR is updated with the receipt of a DD Form 250, and so there is really no system in place now for the government to

track required delivery dates (RDDs), to see if material needed to support a rated production end item is received on time to keep production on schedule. This is left up to the contractor to manage.

Additionally, DPAS currently operates with basically a three-fold classification system for priorities. During a full mobilization, an expansion of the current system into a more elaborate system with subordinate levels of priorities under "DX" and "DO" categories may be required. Consideration of the current Defense requisition priority system of Issue Groups with subordinate priorities may be appropriate for tight centralized control, when supplies of resources are known and sufficient administrative and automated data processing facilities are available.

As touched on earlier in this thesis, there is growing concern over the increase of and the critical dependence that U.S. industry has on foreign-owned domestic producers. The point of concern is that DPAS authority is not extended to foreign companies. Additionally, political concerns by the foreign owners and their government may prevent the foreign owned domestic producer from supplying necessary materials and components to a U.S. mobilization. The following quote provides an excellent illustration of the problem of foreign ownership of domestic producers.

> The Budd Company of Rochester, Michigan, is one of the major suppliers of parts to the automobile industry. Owned by the West German company, Thyssen A.G., Budd supplies all four

> major American auto companies with sheet metal parts, wheels products, frames, and so forth. (Laudon and Laudon, 1988, p. 154)

This issue raises serious political questions such as government seizure that would have to be addressed by legislation or Executive Order during an emergency. The important point is that this area needs to be further quantified, evaluated and contingency plans for different levels of industrial mobilization need to be developed.

B. PREVIOUS STUDIES

The 1981 Report Of The Defense Science Board Summer Study Panel On The U.S. Defense Industrial Base concluded that DPS was not effective. The prime contractors appeared to comply with the DPS. However, the subcontractor and suppliers at the second and third tier levels had a compliance rate of 50 and 25 percent respectively. The prime reason given was the lack of understanding about the system. Additionally, it appeared that there was a general aversion against using the rating with one's preferred suppliers for fear of upsetting the relationships built up over time. The DMS, on the other hand, was considered by the Board to operate effectively. The Board, however, was concerned that the DMS's critical materials was based on 1950s production patterns that may not be adequate in the 1980s and beyond. (Clem, 1983, pp. 118-119)

The problem of better educating all tiers of the defense industrial base was largely resolved by the establishment of

the DPAS in 1984. DPAS is easier to understand and more emphasis is placed on contractor education to include a video-tape program. The education process also helped to ensure greater compliance because the contractors, subcontractors and suppliers were informed about the legal requirements of DPAS. Concern over critical materials appears to be under consideration by DoC. DoC had conducted a study to appraise the relevance of the critical materials, and this part of the DPAS may be phased out. (Telephone conversation, 3 November 1989)

C. MOBILIZATION EXERCISES

Numerous mobilization exercises have been conducted since the late 1970s. The majority of the results of these exercises are classified. The following sections will discuss some of the results of these exercises as they impact or relate to DPAS.

1. Nifty Nugget

In 1978 Nifty Nugget was conducted to test the mobilization and deployment capabilities of relevant U.S. Federal agencies, both military and civilian. The fundamental finding centered on the nation's inability to support mobilization in certain industrial sectors and the lack of mobilization planning, both centralized and at the agency level. (Clem, 1983, pp. 18-23)

These shortcomings have largely been addressed. Industrial-base issues have been surfaced and procedures addressed for both centralized control and specific agencies such as FEMA, DoC, and DoD. This has affected DPAS in a positive way because it first highlighted the criticality of specific materials and components essential to mobilization, and second, it focused attention on reviewing or developing procedures. Additionally, the need for centralized management was given more attention. This centralized management is similar to the WIB and WPB of WW I and WW II, and as in the case in these previous wars, this type of centralized Board played a large role and it could be projected that such a Board would interact heavily with the DPAS during a future mobilization.

2. Proud Spirit

In 1980 Proud Spirit was conducted in a similar concept to Nifty Nugget. The important difference is this exercise was the participation of more civilian players. FEMA, having been established following Nifty Nugget, took responsibility for coordinating civilian Federal agencies. The majority of the exercise results are classified, however, the major findings of this exercise were similar to Nifty Nugget and with the noticeable continued weakness in specific industrial sectors necessary for mobilization and the continued need to develop and refine management procedures at

a centralized level and at the agency level. (Clem, 1983, pp. 18-23)

3. Industrial Responsiveness Simulation

In Summer 1983, U.S. Industry found itself involved in a DoD exercise dubbed an Industrial Responsiveness Simulation (IRS). The object of this exercise was to evaluate industry's ability to expand rapidly in a national emergency. It was a test of production capacity. Industries were allowed free rein with their creative imaginations for increasing production. Cost effectiveness was not a consideration during the exercise. (Vawter, 1985, p. 27)

Some revelations made by the study included serious dependence problems related to offshore producers of electronic components such as integrated circuits, industry belief that some sort of government insurance or protection is necessary to allow manufactures participation in more sophisticated industries, long lead-times required by subcontractors to provide materials and numerous procedural constraints such as priority ratings, which reduced speedy access to capacity. Equally distressing to rapid expansion are Federal Acquisition Requisitions which even a national emergency declaration would not relieve. It was also observed by the industries participating in the exercise, that federal funds must be actually, and not theoretically available. (Vawter, 1985, pp. 29-32)

On the bright side, conclusions were that contractors could indeed increase production capacity and expand output and at reasonable cost but with some conditions: production rate will fluctuate with the economic conditions; second and third tier supplies could bottleneck; the U.S. is and would be dependent on offshore low cost labor foreign products; the private sector might not provide an adequate production base; critical materials which are not presently available in finite and limited quantities could halt production. (Vawter, 1985, pp. 32-33)

The federal government has several tasks to tackle to enhance industrial responsiveness. Minimum capacities to meet the demands in an emergency must be established, documented, disseminated throughout industry and then funded. A formal surge policy is essential and production capacity goals need to be defined early on in the development of policy to assure funding is available when it is needed. (Vawter, 1985, pp. 34-35)

Finally the DoD is lacking leadership to industry. Much of this weak image would be strengthened by formal policy (Vawter, 1985, p. 35).

Earlier mobilization studies, Nifty Nugget in 1978 and Proud Spirit in 1980, both Army Mobex-76 exercises, showed that our mobilization preparedness falls short of acceptable, that government procedures and organizations are deficient and that manpower is lacking to effect a short-notice rapid

deployment of sufficient force. (Pfaltzgraff and Ra'anan, 1983, p. 260)

D. STRUCTURE FOR CHANGE

1. Organization

The Federal Emergency Management Agency (FEMA), established in 1979, is the federal government's overall coordinator for industrial mobilization. This includes industrial preparedness planning and actual administration. FEMA is to provide guidance and coordination to the different Executive agencies. (Clem, 1983, pp. 86-87)

Under FEMA guidance, DoC and DoD have specific mobilization responsibilities.

Applicable Department of Commerce responsibilities include:

> Assuring that adequate supplies of industrial resources are available to meet the requirements of defense, and that industrial resources can be expanded in the event of emergency. More specifically, it is charged with preparing national emergency plans and preparedness programs covering:
>
> --The development of control systems for priorities, allocations, production, and distribution for materials and other resources.
>
> The purpose of the Department of Commerce's priorities and allocation programs is to ensure the availability of materials for defense production under normal conditions and in emergencies. (Clem, 1983, pp. 90-91)

Applicable Department of Defense responsibilities include:

> --Provide specific strategic guidance for emergency preparedness planning and programming.

--Develop and furnish quantitative and time-phased military requirements for selected end-items, supporting resources (materials, components, production facilities), and services.
--Plan for and administer priorities and allocations of authority delegated to the Department of Defense.
--Assist the Department of Commerce in developing production and distribution controls plans for use in an emergency.
--Furnish advice and assistance on use of strategic and critical materials in defense production. (Clem, 1983, pp. 89-90)

2. New Technology

Developments in information systems used in industry today provide possible solutions to allocation management problems of any future mobilization. As mentioned earlier, modern material management techniques such as JIT and MRP have brought with them information systems. The following quote describes a complex system, but one that has potential for use in a centralized allocation system that may be set up during a full scale mobilization.

> Chrysler has set up electronic links between its data center and those of its major suppliers like Budd. This linkage permits major suppliers such as Budd to extract manufacturing releases electronically through terminals installed in all of Budd's work areas. Even the shipping dock at Budd has a Chrysler terminal to verify current and future orders.
>
> All of the major U.S. auto companies have set up such electronic supplier networks....The Automotive Industry Action Group (AIAG) is working to develop a common industry standard. (Laudon and Laudon, 1988, p. 154)

Modern use of linear programming solving large allocation problems on mainframe computers not available during previous industrial mobilizations provide possible alternatives for use by a large centralized allocation agency.

Additionally, once a linear program (LP) allocated available resources, a decision support system (DSS) could be used to allocate the available resources as recommended by the LP solution.

To keep the centralized allocation agency from getting too cumbersome, it could be organized into commodity branches as was done during WW II. Micro-computer work stations could be used to run smaller LP allocations and DSS to direct the individual shipments of materials and components from the supplier to the producer as recommended by the LP. The DSS would recommend the most efficient and effective movement of materials in terms of transportation costs and transit times to meet production schedules.

The concern would be that overall program schedules, i.e., involving different commodities would have to be monitored. This could be resolved by industries using the JIT concept. A tighter production schedule based on the small-lot concept would generate more accurate RDDs for production materials and components. This would facilitate management by commodity and overall program production control would be left to the contractor.

VI. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

A. SUMMARY

This study was conducted with the objective of determining if the current DPAS will be able to adequately allocate limited resources among the various civilian and military production facilities during mobilization. Additionally, secondary objectives included identifying current problems facing DPAS, researching to see if current lessons learned from past wars and recent mobilization exercises have been incorporated into the DPAS, and identifying improvements that could be made to the current system.

A comprehensive literature search was done by the Defense Logistics Studies and Information Exchange (DLSIE), Defense Technology Information Center (DTIC), and through Dialog Information Service.

Chapter I provides brief information, objectives and scope of the thesis. Chapter II provides some background on the relevance of the current industrial mobilization planning, the United State's dependence on foreign sources and scarcity of Defense-related production materials, the current emphasis placed on mobilization by the U.S. Navy, the use of material allocation to control the wheels of national production during an industrial mobilization, and finally, a brief look at some generic methods used to control production using material

allocation. Chapter III provides a historical review of material allocation from WW I to Korea. Chapter IV provides a comprehensive review of the current system for allocation, the DPAS. Current regulations and an actual operation of DPAS at the regional and field level are reviewed. Chapter V discusses concerns about the DPAS. Material allocation and DPAS in terms of recent mobilization exercises and past mobilization studies is discussed. The last two sections of this thesis address conclusions and provides recommendations.

B. CONCLUSIONS

The U.S. continues to be dependent on foreign sources for raw materials and component parts, for high-technology defense production and on foreign-owned U.S.-located production and supplier companies. Both situations represent complicated logistical and political issues.

The fundamental principal "control of production" is achieved through control of supply of raw materials and the means to use them requires preconceived legislation to ensure such control.

Experiences from WW I and WW II show us that the Executive and Legislative processes to set up an organization to administer an allocation system are slow and usually formally-sanctioned long after the need has arisen. This lag time present in WW I and WW II was significant and if an effective allocation system had been ready to use at the outbreak of

hostilities or when defense production began to increase, it may have shortened the war.

History has shown that usually a defense industrial-production build-up will start prior to any declared state of emergency and that some critical material and components will become scarce prior to that declaration. It is important to impose allocation controls just prior to the market forces getting out of equilibrium as this build up occurs prior to the declaration of emergency.

Where to place and who to place in charge of an allocation system is based on political considerations as much as it is based on logical managerial and organizational considerations. History has shown that the success of any allocation program is largely dependent on the personal attributes and characteristics of the person in charge.

Success of the allocation system will depend to a large degree on the thoroughness, and implementation plan. Some type of comprehensive plan similar in detail to the CMP of WW II needs to be set up in order to have an effective allocation system.

Any allocation system would be centralized and be part of a large bureaucratic organization like the WIB and WPB of WW I and WW II respectively. It would involve significant numbers of persons as did the systems used in the past. It would be a large administrative undertaking.

Controlled materials portion of DPAS, based on the requirements of the 1950s, does not cover the critical material essential to the production of modern weapon systems.

C. RECOMMENDATIONS

Legislation should be enacted now to expand the current DPAS to include detailed allocation procedures to be used when critical materials and components become scarce. By having a system in law, much of the lag time experienced in the past could be eliminated. However, it is not recommended that the controlled materials portion of DPAS be dissolved, as this would take us another step away from execution of activity in an industrial mobilization. In other words, some mechanism would be required to initiate the DPAS replacement plan which inevitably would be time and man-power consumptive. Instead, the present plan should be revised to include new controlling materials that are currently scarce and provide for a periodic review of what is qualified as "currently scarce." This new list of controlled materials should be made permanent by law with the provision that it be updated on an annual basis to reflect the controlled materials that represent the current and projected greatest risk to defense production during a mobilization. This legislation would include authority for DoC to implement allocation controls prior to a declaration of an emergency. DoC under this legislation would be able to allocate scare resources as defense production is building up

prior to official declaration of an emergency and therefore prevent the occurrence of severe shortages that would affect critical defense programs. Studies are available that detail the potential critical materials and components that impact defense production. The plan may resemble a system where DoC would provide an annual list to Congress of 20 materials or components. An allocation control time period may be part of the legislation that would require Congressional authority to extend allocation control authority beyond 180 days from the time DoC initiated the controls. These provisions would hopefully satisfy specific industrial commodity concerns about government manipulation of their industry and Congressional concern over too much power in the Executive Branch. On the basis of interviews it is evident that titanium, electronic items, castings and IC chips need to be addressed in such a DPAS revision as recommended above.

A core group of informed persons who can be called upon in the event of an industrial mobilization should be established and who should be habitually responsible for researching the issue and collating new information and ideas as they arise, so that time is not wasted on this effort at the onset of an industrial mobilization.

A risk analysis of materials and components which would prove to have the highest risk of non-availability on the basis of national origin of commodity and logistic pipeline is recommended.

It is recommended that a "straw man" plan for a full-scale industrial mobilization be tailored to current 1990 and beyond production materials usage patterns to the extent of copying the CMP, the most successful plan used in WW II, to include scarce component parts with actual phase-in processes tailored to fit management practices and techniques of today. Specifically, the use of mainframe computers and micro/mini computer work stations for use with LP models, expert systems, decision support systems (DSS), electronic data interchange (EDI) and the inclusion of newer techniques of materials management (e.g., JIT and MRP) in the "straw man" model. The use of JIT and MRP and other modern materials management and production control techniques provide more accurate material quantity projections, more accurate production schedules and more accurate required delivery dates for production input materials.

The DoC and the delegate agencies such as DoD and DoE should keep track of and provide input to, various industry organizations in an attempt to come to an agreement on, or at least find some avenue to facilitate the standardization of automated material management/inventory control systems in terms of EDI and data manipulation for use by a centralized allocation agency during a mobilization.

An allocation group could be evolved from the National Defense Executive Reserve (NDER) to administer an allocation system of WW II-type under a FEMA or DoC umbrella. DPAS

planners should keep in mind that with expansion more trained personnel are necessary at the outset.

Field ISs need ITA-999 feedback. Benefit could be received by setting up and effective feedback system. Field ISs find that DD Form 1519 estimates are inconsistent, thus leaving a credibility gap with contractors. Mr. Degl' Innocenti recommends combining the data on the DD Form 1519 to discern what materials are needed to produce the stated production goals, establish the approximate supply data of available resources and then set up a resource allocation system for available supply to the pre-established DD 1519 production requirements.

Furthermore, DPAS stands to learn a great deal by closely scrutinizing the start up problems that local officials confronted during the October 1989 San Francisco Bay Area earthquake.

APPENDIX A

AUTHORIZED PROGRAMS AND DELEGATE AGENCIES

Appendix A lists the programs and delegate agencies that are authorized to use DPAS. The source is the DPAS handbook, titled Defense Priorities & Allocation System, distributed by the U.S. Department of Commerce, Office of Industrial Resource Administration, International Trade Administration, dated October 1984.

Defense Priorities and Allocations System

SCHEDULE I TO PART 350

Authorized Programs and Delegate Agencies

The programs listed in this schedule have been authorized by the Federal Emergency Management Agency for priorities and allocations support under this regulation. They have equal preferential status.

The Department of Commerce has authorized the Delegate Agencies to use this regulation in support of those programs assigned to them, as indicated below.

Program Identification Symbol	Authorized Program	Delegate Agency
	DEFENSE PROGRAMS:	
A1—	Aircraft	Department of Defense: Army; Navy (including Coast Guard); Air Force; Defense Logistics Agency; National Security Agency; Associated Agencies of Department of Defense, including Central Intel. Agency; Fed. Aviation Admin.; National Aero. & Space Admin.
A2—	Missiles	
A3—	Ships	
A4—	Tank—Automotive	
A5—	Weapons	
A6—	Ammunition	
A7—	Electronic and communications equipment	
B1—	Military building supplies	
B8—	Production equipment (for defense contractor's account)	
B9—	Production equipment (Government owned)	
C2—	Department of Defense construction	
C3—	Maintenance, repair and operating supplies (MRO) for Department of Defense facilities	
C8—	Controlled materials for Defense Industrial Supply Center (DISC)	
C9—	Miscellaneous	
	INTERNATIONAL DEFENSE PROGRAMS:	
	Canada	
D1—	Canadian military programs	Department of Commerce
D2—	Canadian production and construction	
D3—	Canadian atomic energy program	
	Other Foreign Nations	
G1—	Certain munitions items purchased by foreign governments through domestic commercial channels for export	Department of Commerce
G2—	Certain direct defense needs of foreign governments other than Canada	
G3—	Foreign nations (other than Canada) production and construction	

Co-Production

J1—	F-16 Co-Production Program	Departments of Commerce and Defense

ATOMIC ENERGY PROGRAMS:

E1—	Construction	Department of Energy
E2—	Operations—including maintenance, repair and operating supplies (MRO)	
E3—	Privately owned facilities	

OTHER ENERGY PROGRAMS:

F1—	Exploration, production, refining and transportation	Department of Energy
F2—	Conservation	
F3—	Construction and Maintenance	

OTHER DEFENSE, ENERGY AND RELATED PROGRAMS:

H1—	Certain combined orders (see section 350.17(c))	Department of Commerce
H2—	Controlled materials producers	
H3—	Further converters (controlled materials)	
H4—	Distributors of controlled materials	
H5—	Private domestic production	
H6—	Private domestic construction	
H7—	Maintenance, repair and operating supplies (MRO)	
K1—	Federal supply items	General Services Administration
N1—	Approved civil defense programs	Federal Emergency Management Agency

APPENDIX B

CONTROLLED MATERIALS

Appendix B lists the controlled materials in terms of type and grade. The source is the DPAS handbook, titled Defense Priorities & Allocation System, distributed by the U.S. Department of Commerce, Office of Industrial Resource Administration, International Trade Administration, dated October 1984.

Defense Priorities and Allocations System

SCHEDULE II TO PART 350

Controlled materials

Controlled Materials[1]	Minimum quantity* (net tons, except as specified)		Minimum number of days**			
STEEL	Carbon[2]	Alloy[2]	Carbon	High-strength low-alloy	Stainless	Alloy[3]
Bar, bar shapes (including light shapes):						
Bar, hot-rolled stock for projectile and shell bodies[4]	(2)	(2)	45	75	—	'75
Bar, hot-rolled, other (including light shapes):						
Round bars up to and including 3 inches, and squares, hexagons, half rounds, ovals, etc., of approximately equivalent section area	5	(2)	'45	'75	90	'75
Round and square bars over 3 inches, but less than 8 inches	15	(2)	'45	'75	90	'75
Bar-size shapes (angles, tees, channels, and zees under 3 inches)	5	(2)	'45	'75	90	'75
Bar, reinforcing (straight lengths, as rolled)	5	—	45	—	—	75
Bar, cold finished	5	(2)	'75	'105	105	'105
Sheet, strip (uncoated and coated):						
Sheet, hot-rolled	5	(2)	45	75	90	75
Sheet, cold-rolled	5	(2)	45	75	105	90
Sheet, galvanized	(2)	—	45	—	—	—
Sheet, all other coated	5	—	45	—	—	—
Sheet, enameling	5	—	45	—	—	—
Roofing, galvanized, corrugated, V-crimped channel drains	(2)	—	45	—	—	—

Ridge roll, valley, and flashing	(2)	—	45	—	—	—
Siding, corrugated and brick	(2)	—	45	—	—	—
Strip, hot-rolled	(2)	(2)	45	75	90	75
Strip, cold-rolled	(2)	(2)	45	75	105	90
Strip, galvanized	(2)	—	'45	—	—	—
Electrical sheet and strip	5	—	'45	—	—	—
Tin mill black plate (pounds)	12,000	—	45	—	—	—
Tin plate, hot-dipped (pounds)	12,000	—	45	—	—	—
Ternes, special coated manufacturing (pounds)	10,000	—	45	—	—	—
Tin plate, electrolytic (pounds)	12,000	—	—	—	—	—
Electrolytic chromium coated steel[8]	(2)	—	—	—	—	—
Plate:						
Rolled armor	(2)	(2)	'45	'75	90	'75
Continuous strip mill production	10	(2)	'45	'75	90	'75
Sheared, universal, or bar mill production	3	(2)	'45	'75	90	'75
Structural shapes, piling	(2)	(2)	45	'75	'150	90
Pipe, tubing:						
Standard pipe (including couplings furnished by mill)	(10)	(10)	45	—	120	—
Oil-country goods (casing, tubular goods, couplings furnished by mill)	(10)	(10)	45	—	—	60
Line pipe (including couplings furnished by mill)	(10)	(10)	45	75	—	—
Pressure and mechanical tubing (seamless and welded):						
Seamless cold-drawn (pounds):						
Under 20 pounds per foot	5,000	5,000	'60	—	120	120
20 pounds per foot and over	5,000	10,000	'60	—	120	120
Seamless hot-rolled	(2)	(2)	'60	—	120	120
Welded	(2)	(2)	'60	—	120	120
Wire, wire products:						
Wire, drawn	(2)	(2)	45	75	90	75
Nails—bright steel wire, steel cut, galvanized, cement-coated and painted	"5	—	45	—	—	—
Spikes and brads—steel wire, galvanized, cement-coated	"5	—	45	—	—	—
Staples, bright and galvanized (farm and poultry)	"5	—	45	—	—	—
Wire rope and strand	(2)	—	45	—	105	—

Controlled Materials[1]	Minimum quantity* (net tons, except as specified)		Minimum number of days**			
STEEL	Carbon[2]	Alloy[3]	Carbon	High-strength low-alloy	Stainless	Alloy[3]
Welded wire mesh	(2)	—	45	—	—	—
Woven wire netting	[11]5	—	45	—	—	—
Barbed and twisted wire	[11]5	—	45	—	—	—
Wire fence, woven and welded (farm and poultry)	[11]5	—	45	—	—	—
Bale ties	[11]5	—	45	—	—	—
Coiled automatic baler wire	[11]5	—	45	—	—	—
Tool steel (all forms including die blocks and tool steel forgings)(pounds)	500	500	[12]60	—	—	[12]90
Other mill forms and products (excluding castings and forgings):						
Ingots	[11]25	(14)	45	75	75	75
Billets, projectile and shell stock	(2)	(2)	45	75	—	75
Blooms, slabs, other billets, tube rounds, sheet bars	[11]25	(2)	45	75	75	75
Skelp	25	—	45	—	—	—
Wire rod	(2)	(2)	45	75	90	75
Rail and track accessories	(2)	(2)	45	—	—	90
Wheels, rolled or forged (railroad)	(2)	(2)	45	—	—	90
Axles (railroad)	(2)	(2)	45	—	—	90

Controlled Materials[1]	Minimum quantity* (pounds)	Minimum number of days**
COPPER		
Copper and copper-base alloy brass mill products (pounds)[11]:		
Copper (unalloyed)		
Bar	2,000	45
Shapes, wire (except electrical wire)	500	45
Rod	2,000	45
Sheet, plate (24 inches wide and over)	2,000	45
Rolls and strip (up to 24 inches wide)	2,000	45
Pipe, tube (seamless)	2,000	45
Copper-base alloy:		
Bar	2,000	[14]45
Wire, shapes	500	[14]45
Free cutting brass rod	2,000	[14]45
Other rod	1,000	[14]45
Sheet, and plate (24 inches wide and over)	2,000	[14]45
Rolls and strip (up to 24 inches in width)	2,000	[14]45
Military ammunition cups and discs	2,000	[14]45
Circles	1,000	[14]90
Pipe, tube (seamless)	2,000	[14]45
Copper wire mill products:		
Copper wire and cable:		
Bare and tinned	(17)(18)	35
Weatherproof	(17)(18)	40
Magnet wire	(17)(18)	35
Insulated building wire	(17)(18)	45
Paper and lead power cable	(17)(18)	75
Paper and pulp telephone cable	(17)(18)	45
Plastic insulated telephone cable	(17)(18)	45

Controlled Materials[1]	Minimum quantity* (pounds)	Minimum number of days**
COPPER		
Asbestos cable	(17)(18)	60
Portable and flexible cord and cable	(17)(18)	45
Communication wire and cable	(17)(18)	60
Shipboard cable	(17)(18)	75
Automotive and aircraft wire and cable	(17)(18)	45
Insulated power cable	(17)(18)	75
Signal and control cable	(17)(18)	75
Coaxial cable	(17)(18)	75
Copper-clad steel wire containing over 20 percent copper by weight regardless of end use	(17)(18)	35
Copper-clad aluminum wire containing over 20 percent copper by weight regardless of end use	(17)(18)	45
Copper and copper-base alloy foundry products and powder:		
Copper, brass, and bronze castings	—	10/[20]14
Copper, brass, and bronze powder (including copper powder, granular and flake, and copper-base alloy powder, granular and flake)	—	30

Controlled Materials[1]	Minimum quantity*	Minimum number of days**
ALUMINUM		
Ingot, granular or shot, and molten metal		
Extrusion ingot (billet)	(18)	90
Other ingot and molten metal, primary	(18)	60
Other ingot and molten metal, secondary	(18)	—
Sheet and plate:		
Sheet, non-heat treatable	(18)	150
Sheet, heat treatable	(18)	150
Plate, non-heat treatable	(18)	150
Plate, heat treatable	(18)	150
Welded tube	(18)	—
Foil	(18)	90
Aluminum conductor:		
ACSR and aluminum cable, bare	(18)	60
Wire and cable, insulated or covered	(18)	60
Rolled bar, rod and wire (continuous cast or rolled)		
Conductor redraw rod	(18)	60
Non-conductor redraw rod	(18)	60
Other rod and bar	(18)	120
Wire, bare, conductor and non-conductor	(18)	120
Extruded bar, rod, shapes and drawn tube:		
Extruded rod and bar—alloys other than 2000 and 7000 series	(18)	60
Extruded rod and bar—alloys in 2000 and 7000 series	(18)	150
Extruded pipe and tube—alloys other than 2000 and 7000 series	(18)	60
Extruded pipe and tube—alloys in 2000 and 7000 series	(18)	150
Extruded shapes—alloys other than 2000 and 7000 series	(18)	60
Extruded shapes—alloys in 2000 and 7000 series	(18)	150
Drawn tube—alloys other than 2000 and 7000 series	(18)	60
Drawn tube—alloys in 2000 and 7000 series	(18)	120
Powder, flake and paste	(18)	60

Controlled Materials[1]	Minimum quantity*	Minimum number of days**	
NICKEL ALLOYS		Solid Solution	Precipitation Hardened
Rods and bars (except anode bars):			
Hot-rolled, including wire rod	(2)	90	120
Forging quality	(2)	90	120
Cold-finished	(2)	120	165
Sheet and strip:			
Hot-rolled	(2)	90	120
Cold-rolled	(2)	120	165
Foil	(2)	120	165
Plate	(2)	90	120
Pipe, tubing	(2)	90	120
Wire	(2)	120	165
Other mill forms:			
Ingots	(2)	90	120
Blooms, slabs, billets	(2)	90	120
Powder	(2)	90	120
Shapes and forms not listed above (including anode bars)	(2)	(2)	(2)
Castings (less gates and risers, rough as cast)	(2)	90	120

Footnotes to Schedule II:

(1) See technical definitions in Schedule III
(2) All stainless steel products, certain other steel products and all nickel alloy products. By negotiation between the mill and its customer. If no acceptable arrangements are worked out, the Office of Industrial Resource Administration should be notified
(3) For clad products, add 45 days to lead time indicated
(4) Includes projectile body stock, sizes under 2 7/8 inches
(5) If annealed or heat-treated, add an additional 15 days
(6) For welded tubing or high carbon spring steel strip, 75 days
(7) 60 days for high grade (AISI M15 and oriented)
(8) Steel pipe or tubing exceeding 36 inches O.D. is not a controlled material
(9) Applies to special rolled shapes including angles and channels
(10) Published carload minimum (mixed sizes and grades)
(11) Quantity refers to any assortment of wire merchant trade products
(12) If cold-finished, add an additional 15 days
(13) For forging quality, product of one heat
(14) Product of one heat
(15) Includes anodes—rolled, forged, or sheared from cathodes
(16) For refractory alloys, 60 days, except for tube over 5" in diameter, which should be 120 days
(17) Standard package quantities as published by each mill
(18) Standard minimum quantities as established by each mill
(19) Lead time applies to unmachined castings after approval of patterns for production
(20) Small simple castings to fit 12x16 inch flask, 7 days

* Minimum quantity for each size and grade of any items for mill shipment at any one time to any one destination
** Minimum number of days in advance of first day of month in which shipment is required
— Not applicable.

APPENDIX C

SOLICITATION PROVISION AND CONTRACT CLAUSE

Appendix C is an excerpt from the "Federal Acquisition Regulation," Federal Acquisition Circular 84-16, dated May 30, 1986. It shows the required provision and clause that are included in government solicitations and contracts for rated orders.

52.212-7 Notice of Priority Rating for National Defense Use.

As prescribed in 12.304(a), insert the following provision:

NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE USE (MAY 1986)

Any contract awarded as a result of this solicitation will be a ☐ DX rated order; ☐ DO rated order certified for national defense use under the Defense Priorities and Allocations System (DPAS) (15 CFR 350), and the Contractor will be required to follow all of the requirements of this regulation. [Contracting Officer check appropriate box.]

(End of provision)

52.212-8 Defense Priority and Allocation Requirements.

As prescribed in 12.304 (b), insert the following clause:

DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS (MAY 1986)

This is a rated order certified for national defense use, and the Contractor shall follow all the requirements of the Defense Priorities and Allocations System regulation (15 CFR 350).

(End of clause)

APPENDIX D

REQUESTED ENERGY CRISIS PRODUCTION STATUS REPORT

Appendix D is an excerpt from a Requested Energy Crisis Production Status Report which is developed and maintained by the Defense Contract Administration Services. It shows for "DX"-rated orders the particular contractor name, location, contract number, contracted items and quantities, and the particular authorized program.

REPORT NUMBER UNMD080A DATE 89 AUG 29 CAO CODE NA PAGE 173

REQUESTED ENERGY CRISIS PRODUCTION STATUS REQUEST DATE 89 AUG 22 FOR REGION TO REQUESTOR JUOYJ

OCASR LOS ANGELES REQUESTED STATE CA

CONTRACTOR NAME	STREET ADDRESS	CITY - STATE - ZIP	FSCM

PIIN	SPIIN	PINV NOUN	DMS	RB REAS	RB DATE	CLIN	CLNS NOUN	QUANTITY ON ORDER	QUANTITY DELINQUENT	QUANTITY DUE NEXT 60 DAYS	BALANCE ON ORDER
N0022189MA104		FASTENER	0XA3			0002	FASTENER	30			

CONTRACTOR NAME	STREET ADDRESS	CITY - STATE - ZIP	FSCM
	FASTENING SYSTEM		

PIIN	SPIIN	PINV NOUN	DMS	RB REAS	RB DATE	CLIN	CLNS NOUN	QUANTITY ON ORDER	QUANTITY DELINQUENT	QUANTITY DUE NEXT 60 DAYS	BALANCE ON ORDER
F3460189C0743		PACKAGING	DXA1			0001AA	NUT	57,865			26,029
F3460189C1464		PROD ARTLES	DXAT			0001AC	SHIELD NUT	553			172

CONTRACTOR NAME	STREET ADDRESS	CITY - STATE - ZIP	FSCM

PIIN	SPIIN	PINV NOUN	DMS	RB REAS	RB DATE	CLIN	CLNS NOUN	QUANTITY ON ORDER	QUANTITY DELINQUENT	QUANTITY DUE NEXT 60 DAYS	BALANCE ON ORDER
N0018388C0237		R/D	DXAT			0001AA	OSCILLA	4			4
						0001AB	OSCILLA	4			4
						0001AC	OSCILLA	4			4
						0001AD	OSCILLA	4			4
						0001AE	OSCILLA	4			4
						0002	90163FA	1			1
						0003AA	PLAN	1			
						0003AB	TEST PR	1			
						0003AC	TEST IN	1			1
						0003AD	PLAN	1			
						0003AE	MINUTES	1	1		1
						0003AF	ANALYSI	1	1		1
						0003AG	ANALYSI	1	1		1
						0003AH	PARTS A	1			
						0003AJ	SURVEY	1			
						0003AK	ANALYSI	1			

LIST OF REFERENCES

Barach, Bernard M., "Priorities: The Synchronizing Force," Harvard Business Review, Spring, 1941.

Blackwell, James, Project Manager, Deterrence in Decay: The Future of the U.S. Defense Industrial Base, The Center for Strategic & International Studies, Washington, D.C., 1989.

Clarkson, Grovsner B., Industrial America in the World War, Houghton Mifflin Company, 1923.

Clem, Harold, J., Mobilization Preparedness, National Defense University Press, 1983.

Cuff, Robert D., The War Industries Board, The Johns Hopkins University Press, 1973.

Defense Science Board, Report of the Defense Science Board Summer Study Panel on Industrial Responsiveness, May 1981.

Ellison, John N., Frumkin, Jeffery W., Stanley, Timothy W., Mobilizing U.S. Industry, A Vanishing Option for National Security?, Westview Press, Inc., 1988.

Gaither, Norman, Production and Operations Management, CBS College Publishing, 1987.

Laudon, Kenneth C. and Laudon, Jane Price, Management Information Systems: A Contemporary Perspective, Macmillan Publishing Company, 1988.

McKinnon, Daniel W., "A Time For Stock-Taking," The Navy Supply Corps Newsletter, Navy Publications and Forms Center, V. 52, July/August 1989.

Mikesell, Nonfuel Minerals Foreign Dependence and National Security, University of Michigan Press, 1987.

Novick, David, Anshen, Melvin, Truppner, W.C., Wartime Production Controls, Columbia University Press, 1949.

Pfaltzgraff, Robert L., Ra'anan, Uri, The U.S. Defense Mobilization Infrastructure: Problems and Priorities, Archon Books, 1983.

Smith, R. Elberton, United States Army In World War II, The War Department, the Army and Economic Mobilization, Government Printing Office, 1959.

U.S. Department of the Air Force, Contract Administration Volume 1, Extension Course Institute, Air University, 1986.

U.S. Department of Commerce, Defense Priorities & Allocation System, Government Printing Office, October 1984.

U.S. Department of Commerce, Bureau of the Census, 1982 Census of Manufactures, General Summary, Government Printing Office, March 1986.

U.S. Department of Commerce, Bureau of the Census, 1958 Census of Manufactures, Summary Statistics, Government Printing Office, 1961.

U.S. Department of the Defense, Logistics 2010, Government Printing Office, 1988.

U.S. Department Of Defense, General Services Administration, and National Space and Aeronautics Administration, "Federal Acquisition Regulation," Federal Acquisition Circular 84-16, Government Printing Office, May 30, 1986.

U.S. Defense Logistics Agency, Production Manual For Contract Administration Services DLAM 8300.1, Government Printing Office, October 1986.

Telephone conversation between Mr. Richard V. Meyers, DPAS Program Manager/Compliance Officer, U.S. Department of Commerce and the author, 3 November 1989.

Vawter, Roderick, "Industry Looks at the U.S.'s Ability to Surge," Defense Management Journal, Government Printing Office, Second Quarter 1985.

Vawter, Roderick L., Industrial Mobilization: The Relevant History, National Defense University Press, 1983.

Webber, Michael D., "Strategic Materials Planning Crucial for IS," INFOSYSTEMS, January 1988.

Williams, Benjamin H., The Economics of National Security, Volume XIII, "Production," Industrial College of The Armed Forces, Government Printing Office, 1954 and 1957.

INITIAL DISTRIBUTION LIST

		No. Copies
1.	Defense Technical Information Center Cameron Station Alexander, Virginia 22304-6145	2
2.	Library, Code 0142 Naval Postgraduate School Monterey, California 93943-5002	2
3.	Prof. Paul M. Carrick, Code 54Ca Department of Administrative Sciences Naval Postgraduate School Monterey, California 93943-5000	1
4.	Mr. Richard V. Meyers Program Manager/Compliance Officer Defense Priorities And Allocation System U.S. Department of Commerce Room H-3878 Washington, D.C. 20230	1
5.	Mr. David Degl'Innocenti Code GFAP Defense Contract Administration Services Management Area San Francisco California San Bruno, California 94066	1
6.	LCDR Robert D. Sutter, SC, USN Supply Department TRIDENT Refit Facility, Bangor Silverdale, Washington 98315-5300	1
7.	Defense Logistics Studies Information Exchange U.S. Army Logistics Management Center Fort Lee, Virginia 23801	2

Thesis
S86663 Sutter
c.1 The Defense Priorities and Allocation System in an industrial mobilization.